

COAL AGE

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Let George Do It

WAR means great sacrifice, and at such times there is a tendency on the part of many individuals to "let George do it." When the band plays the "Star Spangled Banner," we are quick to bare our heads and applaud vociferously.

Oh yes! We are patriotic. We love America and all that she stands for. We want a free ocean, and we propose to see that there are no more Kaisers and Czars. All the peoples of the earth are to have liberty at last.

Such talk sounds fine, but it won't go far or accomplish much if we each of us decide to "let George do it." The seven-billion dollar bond issue authorized by the Government can only be a success if all of us American citizens lend material aid by adding our respective mite to the sum total.

This tremendous loan would require more than twenty years for full allotment, if a million dollars were subscribed for bonds each working day. The outstanding currency of the country amounts to only \$45 per capita, while the loan itself amounts to \$70 for every man, woman and child in the country.

There is no doubt that thousands of rich men and hundreds of corporations will subscribe huge sums to the purchase of these war bonds. However, the poor man must do his share, for few rich men can invest largely in the loan without first selling quantities of other securities. If our wealthy citizens are forced to do this on a large scale, in order to see the loan

properly floated, it would mean a serious decline in investment values and perhaps a panic. Furthermore, in the uncertain days to come there is no better way for the man of small means to safeguard his savings than by investing in a mortgage on "Uncle Sam."

This is a time when we must use sense in the practice of economy. As a nation, our besetting sin is our tendency to rush to extremes. We should retrench, but not in a way that will handicap future operations and ultimately result in loss. We can cut out long summer vacations, joy rides in our autos, many of our amusements, waste in our kitchens and extravagance in our dress. We can work longer hours, eliminate futile effort and give our entire attention to big, constructive plans. We can save on fuel, oil and general supplies.

But we make a mistake when we try to save by not buying a motor and waste time through using a mule. Now is the time to keep our plants in prime condition and spend our money even more lavishly than ever for machines to replace men, and the most modern equipment to promote safety and production.

We may rightly expect this war to revolutionize the science of mining, and to particularly change present methods of fuel combustion. Of course, the high prices of materials necessitate careful buying, but those companies that cut out "two-penny" economy and plunge ahead on the road to higher efficiency will serve their country best and be rewarded for their foresight in the reconstruction days to come.

Ideas and Suggestions

Circuit-Breaker Alarm Bell

By W. H. RUSSELL*

The device illustrated herewith has cut our "power off" time to a minimum and results in a material saving to the company.

In the plant where I am working the mining-machine power line is protected by a hand-operated circuit-breaker in the care of a busy hoisting engineer. Frequently this circuit-breaker would open without attracting the engineer's attention, the machine thus being kept idle until someone in the mine took the time and trouble to call on the telephone.

By connecting a vibrating bell as shown in the accompanying sketch, the engineer was provided with a signal that not only informed him when the breaker opened, but

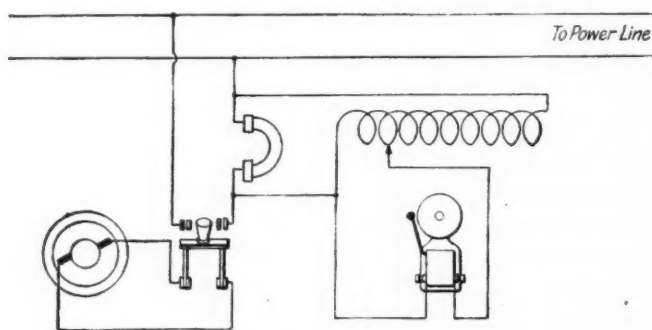


DIAGRAM OF ALARM CIRCUIT

also indicated the cause. If this was a short on the line, the bell would ring continuously; if a momentary overload, it would ring spasmodically. The device would also show whenever there was an excessive demand for power, such as a machine-runner trying to start his machine after moving his controller to the off position when the power failed.

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Attaching Rubber Hose Coupling

By E. L. DAVIS

Among the jobs that are difficult when not gone at in the easiest way, but that are easy when done right, is that of attaching a coupling to a rubber hose. Following is one method described in *Power*.

Heat the coupling in a forge or with a blowtorch to a dull red and, holding it with a pair of tongs or pliers, thrust it into the hose end, held firmly in a vise or by other means. Then promptly plunge the hose end and coupling into water. The heat of the coupling will vulcanize the rubber to it, and after affixing the clamps it will be absolutely impossible to pull it off if the job is well done.

I have used this method many times and find it easy and satisfactory. It is also much simpler than many methods now employed.

"Off Again, On Again, Gone Again"

By A. F. DICKSON*

If a practical mining man was asked, "What causes the most frequent delays in the production of coal while the mine is in operation?" undoubtedly the answer would be, "Wrecks"—that is, the derailing of cars, or motors off the track. And if asked again, "What can be done to remedy or lessen the trouble?" a satisfactory answer might not be forthcoming. This is because little thought seems to be given to this matter. The neglect does not arise from a lack of knowledge of what to do to prevent, to a large extent at least, wrecks of cars and motors, but from a seemingly unexplainable indifference on the part of those who are directly responsible.

Without doubt every mining man is familiar with the stationary rerailer, or retracker. Taking this for granted, are you fully utilizing these time- and labor-saving devices? Can you count the number of rerailers in your mine on one or both hands? If you can, you have far from enough, and are not using to your own advantage the possibilities of this inexpensive contrivance.

The more variable the grades in a mine the more rerailers can be used to advantage. In some mines there are many parts of the haulage road that can be raised, and other parts lowered, these changes meaning a great improvement in the general haulage; but even with the best graded roadway possible the derailing of cars from various causes cannot be eliminated entirely.

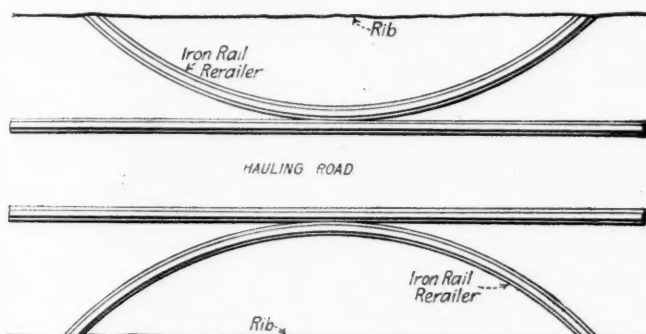
The first thing to do with cars that are off the track is to replace them with the minimum possible delay. It is probable that at least 80 per cent. of wrecks, or cases of cars jumping the track, take place at the same point or points. Realizing this, the task of lessening the delays from these causes is decreased considerably and does not assume the gigantic proportions that might at first be imagined. This is because efforts may be concentrated at these points so as to minimize the trouble.

Recall from memory just where you have the most trouble with derailed cars, or where they are derailed most frequently. It will soon be acknowledged that these points are at the latches, frogs, turnouts and short turns, or on grades where trips go down one hill and then suddenly go up another, thus jerking the cars off the track. Possibly they will be at swing-offs, where the cars are bumped together violently. In one particular mine, where the motor swing-off was down a steep grade, much trouble and consequent delay was experienced by the derailing of cars caused by running trips coming in violent contact with other cars that had not yet been put on the line. As many as a dozen cars would sometimes be thrown off the track in this manner. The parting crew, as was the custom for a long time, would get a post or rail and lift the cars on one by one. This took considerable time, and resulted in a big decrease in the output.

*Roscoe, Penn.

This went on through the administration of several mine foremen. Then came a new foreman, who, as soon as he became aware of the frequent delays at this point, ordered three stationary rerailers to be immediately installed at the seat of the trouble. These were placed about 50 ft. apart. After their installation further trouble at this point from derailed cars was negligible. No matter how badly the cars were piled up, it was only necessary to grip them onto the line (an endless haulage), and they were guided onto the track easily and quickly by the rerailers.

Having determined the contributing causes of the continual derailment of cars in the mines, let us take a survey of the damage resulting from trips being off the track. Suppose a car turns in at a frog. If it is in the middle of a long trip, it will likely cause other cars to jump the track and probably be pulled for 100 yd. or possibly farther. A wheel is broken, perhaps two or more; a rail is turned over; the road is spread; the jolting of cars off the track causes tons of coal to be shaken from them onto the roadway; this coal will probably wreck another trip if not immediately cleaned up; the miner loses several bushels of coal which he would otherwise be paid for;



A SIMPLE AND PRACTICAL RERAILER

some of the cars will likely have to be shopped or put out of commission until repaired; or they may be slightly damaged, passing muster for the time being but later being the chief cause of another disastrous wreck.

The rail bonds in many such cases are cut, resulting in an inefficient electrical return, thus causing big trips to stall on up grades. Timbers are knocked out. These, in many cases, have high-voltage power wires attached to them, and when they are torn down in this manner a short-circuit is caused. Wires are badly twisted or pulled out of splices. The result is that the whole mine is idle until the electricians can be found and sent to the scene to repair the damage.

Again, cars off the track which are pulled for any distance sometimes are the means of breaking pipe lines, and that means much more trouble. Thus there are many reasons why we should try to eliminate or remedy the trouble arising from the derailing of cars.

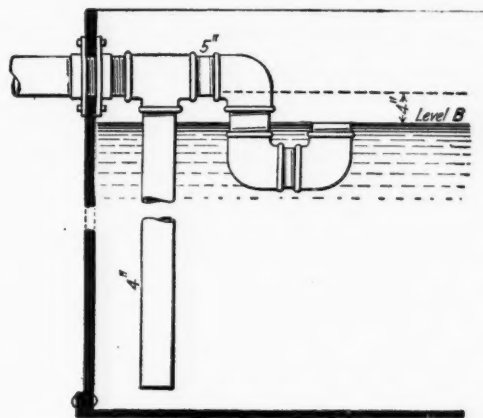
In order to have more efficiency in the general haulage, rerailers or retrackerers should be placed at short distances along the road on either side of frogs, latches, short turns, pick-ups and swing-offs, and at other places which are a continual source of trouble from the derailing of cars.

The retrackerers should be so installed that they will rerail the empty cars coming in and the loaded ones going out. By such means, when cars get off again, they get on again and are gone again.

Removing Sediment from Tank

A recent article describing in detail a method of removing sediment from a tank, calls to mind an arrangement I saw some time ago. The overflow takes water from the bottom, but it also takes some from the surface (skims the water), and the pipe forms a trap and prevents the escape of sewer gas, says J. E. Noble in *Power*.

The overflow is 5-in. threaded pipe on the U end and 4-in. on the drop pipe. When there is a small overflow the water is all taken from the bottom of the tank, but

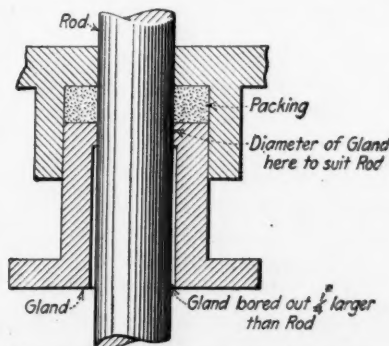


SURFACE AND BOTTOM OPENINGS TO OVERFLOW

when there is a heavy overflow it starts the siphon and the water is largely taken from the surface of the tank for a depth of 4 in. at a time, taking most of the floating pieces, leaves, etc., with it, and the siphon breaks at level B so that the overflow is always sealed.

Preserving Pump Piston Rods

An engineering correspondent of the *Shipbuilding and Shipping Record* recommends the method shown in the accompanying diagram, and adopted by him, for preserving feed and other force-pump piston rods and mitigating errors when adjusting glands of working pumps. The article is reprinted in *Iron and Coal Trades Review*, Mar. 2, 1917, giving the advantages of the appliance. Boring out the gland was adopted with separate pumps supplying feed water to boilers of 6000 hp. and a



METHOD OF PRESERVING PUMP PISTON RODS

working pressure of 245 lb. per sq.in. The gland flanges were not weakened in any way. By adopting this method it is said to be practically impossible for the rods to heat up, and thus the scoring and roughening of the rods is avoided. Should the gland require to be hurriedly screwed up when the pump is working, danger to the rods is largely obviated.

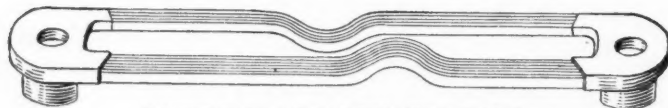
Rail-Bonding Precautions

BY H. H. FEBREY*

SYNOPSIS—The current-carrying capacity of a rail is high, but when laid in a track the joints are points of high electrical resistance. To obviate this, adjacent rails must be bonded carefully. If properly installed, there is little difference in the efficiency of compressed and pin-expanded terminals. In either case, however, care must be exercised in bond installation.

Owing to their great current-carrying capacity, rails are valuable in a traction circuit. They have a large copper equivalent, a 40-lb. rail being equal to slightly more than 400,000 c.m. of copper at a steel-copper ratio of 12:1. Compared with the amount of copper in the overhead circuit, they have greater equivalent copper cross-section, ordinarily, and on account of their low resistance they effect a large saving in copper investment. Few joints exist in the overhead circuit, and attention must necessarily be directed to the rail joints, so as to obtain electrical continuity in the negative side of the circuit.

With joints in each rail every 30 ft., it is obvious that high resistance at these points will multiply rapidly. Five miles of continuous 40-lb. rail has a resistance of 0.6



DOUBLE FLAT LAMINATED BOND

ohm, or 0.3 ohm for both rails of a track in parallel. High resistance joints might easily double these figures or increase the total resistance by a far greater amount. The resistance of a rail joint may be almost anything short of an open circuit, and when it is considered that a 2/0-26-in. bond properly installed has a resistance of about 0.000166 ohm, it should be evident that good bonding is not only worth while, but is a necessity.

If the cost of lost power were the only consideration, arguments in favor of proper bonding would not have much weight where power is cheap. Low voltage, however, is troublesome, increases motor maintenance cost and reduces output by slowing up the trips.

It is hoped that these few points have made it clear why rail bonds are important. Consideration will now be given to the kinds of bonds which are best suited for mining conditions and proper methods of installation.

The manufactured stud bond, as now produced, is in most cases perfect in point of workmanship and quality. There are two widely used types of bond terminals—namely, compression and pin-expanded. The compression type is made with a solid stud which is compressed into a hole in the web of the rail with a compressor, specially designed for the purpose. The pin-expanded type is made with a tubular stud which is expanded into the hole in the rail by drift pins of sizes to accommodate each diameter of terminal.

These two types are the ones most commonly used in mines, the soldered type having passed out of use

except in a very few places. There are arguments for and against either type as compared with the other, and if installed side by side by experienced workmen they would show practically no difference in efficiency and life of terminal contact. But the securing of workmen to install the bonds properly is a problem, and for this reason the pin-expanded terminal offers more likelihood of obtaining efficient results with unskilled labor.

It is true that some operators are discouraged from failures of both types of bonds mentioned, and this is unfortunate. Many failures are due to lack of knowledge of the essentials necessary to obtain a good installation, and in many cases incorrect selections or recommendations of the type of bond to suit mining conditions are made.

It is the purpose of this article to single out the vital points which will enable mine operators to see why, in the particulars touched upon, they are not getting results, and to suggest what seems most logical to meet average, prevailing conditions.

BONDS FAIL THROUGH POOR CONTACT

The matter of terminal contact with the rails is of prime importance and is the principal essential wherein bonds fail. The contact of the bond terminal with the steel must be perfect and air-tight, in order to prevent deterioration from oxidation of both surfaces, because of the corrosive action of the elements. Both the surface of the bond terminal and the hole in the rail must be clean and bright at the time the bond is installed. However, the question is often asked, "How can we get the men to take these precautions when left to themselves?" The main difficulty will be to get clean holes, and this can be obtained in most cases if less effort is made to economize where the bond holes are drilled at the rolling mills. It is not uncommon to find that rails are ordered drilled for bonds with the holes of the same diameter or $\frac{1}{32}$ in. smaller than the bond terminals. If the superintendent would inspect this drilling on delivery of the rails, he would find that in many instances the holes had been punched; and if drilled, that there was a wide variation in the diameters.

Perhaps the intention was to clean the rust from the holes with a round file before inserting the bonds. What frequently happens is that, where the holes run large, the workman finds the bonds will go in without filing out the holes and, unless his conscience is apt to trouble him, the bonds are installed in uncleaned holes. The bonds may be tight and yet make poor contact, but the trouble is not detected until test is made or the voltage is poor.

As a precaution against the labor problem, the holes should either be drilled for the bonds on the ground or else ordered drilled at the mill of a size small enough to prevent the bond terminals from being inserted without redrilling or reaming the holes to the nominal size of the terminals. This seems prohibitive to many, owing to the apparent cost of reaming or drilling the holes on the ground. It is doubtful if the cost of reaming a hole clean is any greater than running a file through it. If it does cost more, it is a good investment.

It is not always necessary to use an "old man" and set up for reaming with a ratchet, as time is lost there-

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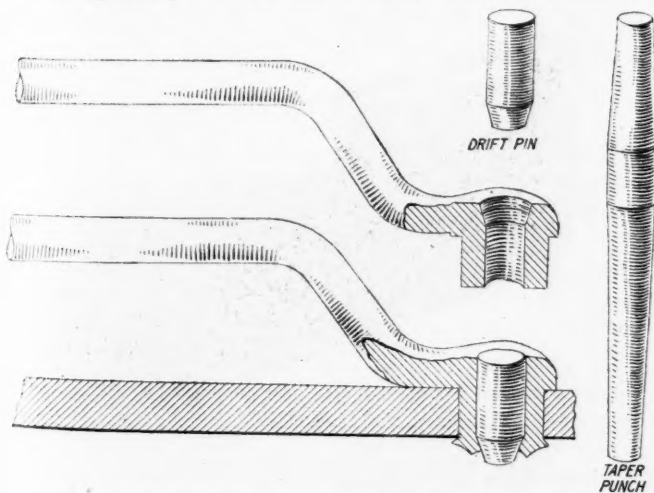
by. Where two men are at work bonding, a simple method sometimes used is to force a pointed pinch bar into the ground or tie and back the ratchet against it. This is quick and cheap and offers no interruption to traffic. An allowance of $\frac{3}{32}$ in. under the bond terminal diameter, if made in the specifications for mill drilling, would create a condition whereby workmen could not get the bonds in without enlarging the holes or unnoticeably damaging the bond terminals. This amount is recommended because it has been found that mill-drilled holes have run as much as $\frac{1}{16}$ in. oversize.

The reaming herein recommended should be done with a cylindrical reamer of the same diameter as the bond terminal. What is known as a bridge reamer, which has a tapered end, is the best type to employ. A reamer which is tapered throughout its entire length should not be used. Where drilling is to be done in the field, the holes should be drilled the same diameter as the bond terminals, and the drills should be properly ground.

The bond terminals become dirty and oxidized in handling, and these should be polished with fine sandpaper or emery and wiped clean before insertion in the holes. Where lubricants are used in drilling or reaming, the holes should be cleaned with a dry rag or gasoline. For mine work, where it is difficult to get the workmen to observe these precautions, it is better to use no lubricant at all, but run a dry rag through the hole to remove dirt or dust which may be kicked into the holes after they are drilled or reamed.

Moisture on the terminal contacts should carefully be avoided. If the bonding is to be done out of doors, do not bond in wet weather. The most difficult places inside to get a good job will be where there is water dropping from the roof or covering the rails. If it is borne in mind that once the bond terminal is tight in the hole moisture will be excluded, it is evident that every precaution should be taken to keep the hole and the terminal dry until installation is complete.

If water covers the rail joint, it can be drained into a hole temporarily. When this is done, the mud should be



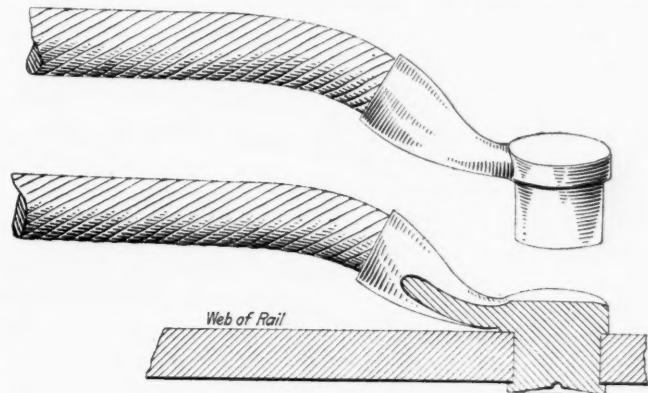
PIN-EXPANDED TERMINAL BOND, PUNCH AND PIN

scraped from the face of the rail on both sides before drilling is started, and the bond applied immediately after wiping out the hole.

These points are not so hard to obtain as might be anticipated, but the main difficulty is that with the labor at hand it is necessary to eliminate the human element as much as possible. That is why the small mill-drilled

hole is advocated. The human element likewise enters into the matter of properly applying the bond terminals. The pin-expanded type offers greater assurance of uniform results in the hands of inexperienced men than any other manufactured bond.

The operation is a simple one, consisting of driving a self-directing tapered drift pin, of a size to accommodate



COMPRESSED TERMINAL BOND

the particular bond being used, clear through the hole in the terminal. This is followed by a short steel pin of slightly larger diameter, which is driven in until flush with the shoulder of the bond terminal and left there. The action of the pins is to expand the copper radially and, in consequence, a perfectly uniform contact is obtained from one end of the hole to the other.

On the other hand, the efficiency of the compressed terminal type of bond depends largely upon how the compressor is located before starting the compression and the amount of pressure which is exerted by the man operating the tool. Both types require the same care with respect to clean holes and terminals.

The form or shape of bond is the next thing to determine, and there is no doubt that many failures have resulted from the use of forms which a little consideration will show to be inadequate for the service they are subjected to. Too much consideration is sometimes given to first cost, when a little foresight in the way of expenditure will prove to be economical in the long run. The life of a rail bond from a consideration of the vibratory stresses to which it is subjected is dependent primarily upon the form in which it is made—that is, whether it is made with solid copper conductors, flat strips or ribbons, or fine wire strands. It is dependent secondly upon its length.

Mine tracks impose severe conditions for rail bonds to survive, and the bond which will best withstand the movements of the joints is the one that should be adopted for this service. Tests have shown that the stranded bond will stand more vibratory stresses than any other form of bond conductor. It should be clear, therefore, that a long stranded-wire bond is the one which is most logical. With the poor road-bed conditions which are prevalent in mines, it is difficult to keep the rail joints tight, and loose joints are common.

The practice of putting bonds under the splice bars or concealing them is too often attempted with an idea of saving in the cost of copper. But the concealed bond was not conceived with the idea of saving copper, but of protecting the bonds from copper thieves in exposed districts on traction lines. A bond should not be used under

the splice bars where there is not sufficient room for it to be wholly free from interference with the splice bars after they have been drawn into position.

The effect of squeezing a bond between the two surfaces of steel is to chafe and gradually break the strands, or the conductors may get pinched in one or more places, which produces a short lever action when the rail joint moves. The conductors will thus sometimes break off entirely from the terminals. But even where there is room for the bonds under the splice bars, it is difficult to install them without damage, and the question of labor enters into this feature as much as any other.

It seems most logical, therefore, to use a flexible bond outside the splice bars. The argument is brought forth that owing to the many car derailments the bonds are subject to damage from that source, but it has been found that by putting the bonds on the gage side and fitting them in under the bolt heads or nuts that they are sufficiently protected, because the wheel flanges cannot touch them and the tread of the wheels is raised by the flanges. The exposed bond also has the valuable advantage

of being open to visual inspection, broken bonds being thus readily located. A concealed bond may be broken except for a few wires, and cannot be detected without the use of a bond tester, or evidence of heating.

In some instances a long bond is used and placed under the splice bars with the terminals extending beyond their ends. This is far superior to a short, concealed bond, but should not be employed unless the bond is free after the plates are in position.

From a mechanical standpoint, it is not a good plan to have anything between the splice bars and the rail which tends to prevent them from being brought "home." It is difficult to keep such a joint tight, and play is bad for both the track and the bond.

No attempt has been made in this article to touch upon technical matters, the idea being to discuss practical points only. Satisfactory bonding results from a proper selection of bonds to suit the conditions involved and care in their installation. The installation can be regulated largely from the office, by setting up conditions which compel a certain procedure on the part of the workmen.

Coke Braize and Its Utilization

By W. A. HAMOR*

SYNOPSIS—Coke braize, or the refuse too small to be readily used as a fuel, may be utilized in a variety of ways. The most promising of these, from a financial standpoint, is its use as a boiler fuel. Forced draft is necessary for its combustion. The briquetting of this material and its employment in the gas producer have not been carried on as extensively in this country as in Europe.

In byproduct coke-oven practice it is customary to class as "braize," or breeze, that portion of the coke which passes through a screen having $\frac{1}{2}$ -in. square openings. In fact, a $\frac{1}{2}$ -in. screen may be regarded as the dividing line or means for discriminating between small-sized coke (pea and nut), which may readily be marketed for domestic use, and finer particles, including dust, which constitute braize¹ and which cannot ordinarily be sold as a domestic fuel.

The following table presents several analyses of braize made in byproduct coke plants in different districts of the United States:

	Per Cent. Moisture	Per Cent. Volatile Matter	Per Cent. Fixed Carbon	Per Cent. Ash	Per Cent. Sulphur
Lake District.....	12.0	3.5	84.5	12.0	0.70
Atlantic District.....	12.0	4.0	82.0	14.0	0.80
Alabama District.....	14.0	3.5	82.0	14.5	1.00

The calorific power of dry braize approximates 12,500 B.t.u. per lb., so that it is actually a fairly high-grade fuel.

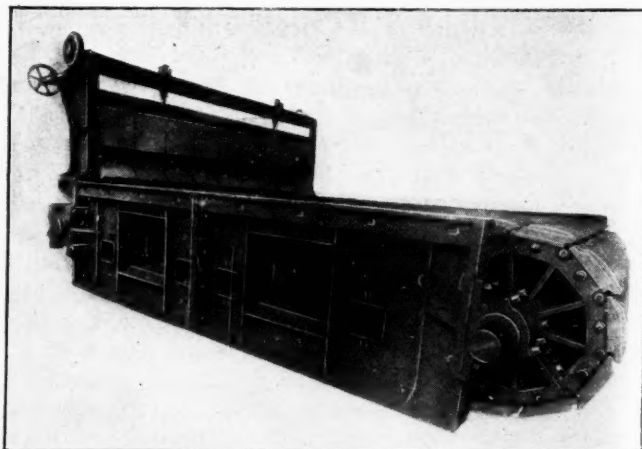
Formerly, much of the fine screenings (smaller than $\frac{3}{8}$ in. obtained in the production of coke) was wasted. While this braize possesses a comparatively high fuel value, it is difficult to burn by ordinary means, and the

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¹Average sieve tests made on samples of coke braize from one of the largest byproduct coke plants in the Lake District gave these results: Through $\frac{1}{8}$ in. and over $\frac{1}{8}$ in., 23.79 per cent.; through $\frac{1}{4}$ in. and over $\frac{1}{4}$ in., 26.03 per cent.; through $\frac{3}{8}$ in., 50.18 per cent.

use of forced draft is essential for its proper utilization. Recent improvements in combustion appliances have, however, made its utilization entirely feasible and economical, and several types of equipment originally designed for the combustion of anthracite culm have been found readily adaptable to the burning of coke braize. Reference is particularly made to the Coxe traveling grate, illustrated herewith, which is now being successfully operated with coke braize in several plants.

The stoker shafts are of cold-rolled steel and are 42 in. in diameter; keyed on each shaft are two cast-iron

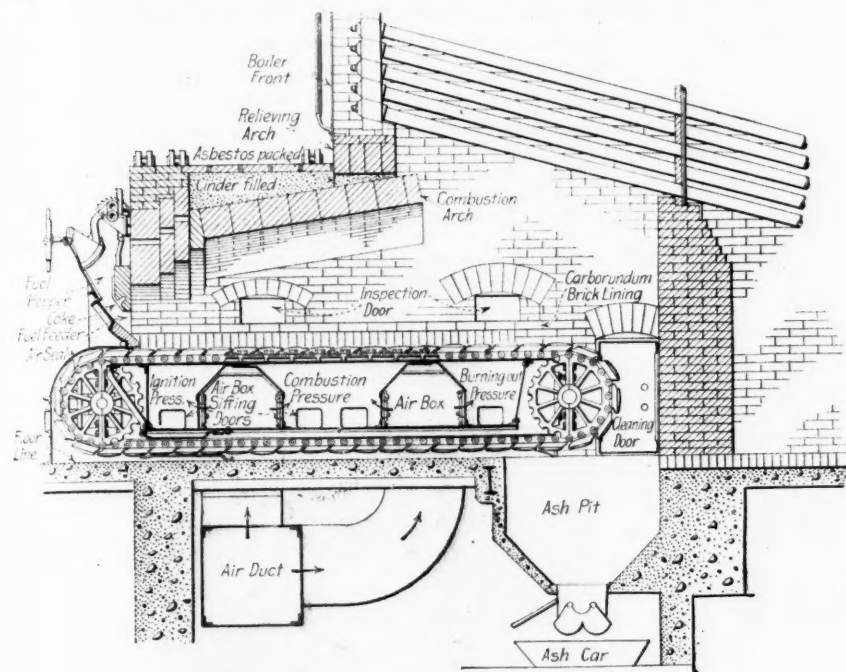


REAR VIEW OF COXE TRAVELING GRATE

sprockets, located just inside of the side frames. Cast-iron flanges project inward from the side frames. To these flanges are bolted sheet-steel plates, forming a floor between the side frames, about 10 in. from the bottom thereof, with vertical air baffles at each end of the stoker. On top of the floor are built two air boxes, or tuyere boxes, extending across the stoker between the side frames and communicating on one end through rectangular open-

ings in one side frame with the air connections from the forced-draft air duct. The tuyere boxes are constructed of cast iron and sheet steel, and on the front and back sides of each box are register or grid dampers of cast iron, through which the draft may be admitted to the air compartments under the grates.

The fuel-supporting surface is made up of keys or grate tops, which are small castings approximately $\frac{3}{4}$ in. wide,



SECTION OF COKE GRATE AND SETTING

9 in. long and 2 in. deep. The top surface is curved, and the front end of each key matches the rear end of the next key. Pads on one side of each key space the keys about $\frac{1}{32}$ in. apart, thus forming the air openings. The keys are supported on carrier bars of cast iron, to which are bolted dovetail sections on the upper surface; on the bottom of the keys are cast dovetails which engage with those on the carrier bars; and at each end of the carrier bars is riveted a steel forging which projects downward between the links of the carrying chain, to which it is fastened by a bolt.

The chains, which are made of drop-forgings held by steel pins, all of ample section to carry the load, are carried over the sprockets at the front and rear ends of the stoker, returning under the floor of the air compartments. The rear shaft is the driver and extends through the side wall of the boiler, where it is keyed to a cast-iron worm-wheel mounted in a heavy cast-iron inclosed gear case. Suitable shearing pins are provided between the rim and web of the wormwheel to guard against wrecking the stoker in the event that any obstruction chances to get into the chain.

The worm which drives the main gear is of steel and is keyed to a cold-rolled steel transmission shaft $2\frac{1}{2}$ in. in diameter. The transmission shaft may extend either forward to the front of the boiler or back toward the rear to any convenient point. On the end of the transmission shaft is keyed a second cast-iron wormwheel, suitably housed in a closed cast-iron gear case. The wormshaft that actuates this gear may be driven either by belt from a lineshaft, by electric motor or by small steam engine. Both gears are run in oil.

On the front end of the stoker is the coal hopper, which is constructed of sheet steel reinforced by angle iron and is carried between the cast-iron hopper sides bolted to the top of the stoker side frames. The coal gate is a heavy casting protected with special firebrick tile on the side toward the fire. The gate is raised and lowered by a cross-shaft carrying cast-iron pinions engaging in cast-iron racks attached to the coal gate. A hand wheel is provided at one side of the hopper for manipulating the gate. At the bottom of the hopper and supported between the side frames is a coal apron made of cast-iron sections and lined with firebrick. The upper ends of these apron sections may be lowered so that there is sufficient opening across the stoker to fire by hand when starting the fire. It is recommended that the air for combustion be supplied at a static pressure of 2 to $2\frac{1}{2}$ in. of water. Any suitable apparatus may be used, such as steel-plate fans, turbine- or engine-driven, or multiblade fans similarly operated. The fuel is fed to a hopper extending across the front end of the stoker above the grate, from which it is deposited on the grate, the thickness of the fuel on the grate being regulated by the adjustable coal gate. Ignition takes place immediately, and combustion is supported by forced draft under the grates. There are three or sometimes four air compartments, each

extending crosswise of the furnace; in each of these the air pressure may be independently regulated. It is thus possible to vary the rate of combustion over each air compartment as desired. At the rear end of the grate, where it turns over the sprocket wheels, the ash is discharged into the ash pit.

The three compartments may, for convenience, be called the ignition, combustion and burning-out compartments. Ignition takes place above the front compartment, the bulk of the combustion over the second, while the third compartment serves for burning out the remaining carbon at ordinary ratings. The function of these compartments is to enable the operator to vary the pressure under the grate in accordance with the thickness of fuel immediately above that section. The rear-end compartment, or burning-out area, is subdivided laterally into three distinct compartments, in each of which the air pressure may be separately controlled. Thus, if there is a tendency for the fuel to burn out on the sides, at the rear end, the side compartments may be closed and the air pressure retained in the center. This grate is sold by George J. Hagan Co., Pittsburgh, Penn.

Under regular operating conditions, in connection with a 500-hp. boiler, one of these stokers is stated to develop from 150 to 200 per cent. of boiler rating, with efficiencies ranging between 65 and 70 per cent. The ratio of water heating surface to grate surface in this installation is 42 to 1. The braze had the following composition:

Moisture.....	8 to 12 per cent.
Volatile matter.....	2 to 4 per cent.
Fixed carbon.....	76 to 80 per cent.
Ash.....	18 to 20 per cent.
Caloric power.....	11,500 to 12,000 B.t.u.

The Parsons distributor has also been successfully used for burning coke braize. It consists of a steam-driven injector blower which intermittently draws gas from the boiler furnace and projects it at high velocity against a small portion of the fuel, which is simultaneously delivered into the path of the gas by a reciprocating pusher. A test by C. J. Bacon showed the efficiency and capacity of the distributor to be nearly the same with coke dust as with coal.

Coke braize is also used as a fuel in gas producers, although this application has not received such development in the United States as in Europe.²

Ramsburg³ has reported the data obtained from a complete series of efficiency tests conducted by Karl Bunte on a set of Kerpeley-Mareschka producers, using a mixture of coke and braize of the following sizes:

	Per Cent.
0 to 11 mm. (through $\frac{1}{2}$ in.)	10.2
11 to 25 mm. (over $\frac{1}{2}$ in. and through 1 in.)	43.3
Above 25 mm. (over 1 in.)	46.5

The results of these tests showed a net efficiency of 81.9 per cent.

It may be mentioned in conclusion that the briquetting of coke braize has received some consideration⁴ but, in America at least, this application of the fuel does not seem to be so promising as its direct combustion in large installations with the use of properly designed grates and stokers.

F. S. Peabody Appointed Head of Fuel Board

The Government, through the Council of National Defense, has appointed Francis S. Peabody, of Chicago, chairman of the "Fuel Board." This commission, or committee, is created as an emergency war measure, for the purpose of so regulating the production and transportation of coal that unnecessary losses will be eliminated.

Mr. Peabody as chairman of the board is peculiarly fitted for that important post. He is president of the Peabody Coal Co. in Chicago and is descended from a line of ancestors who have been in this country more than 200 years. He is a man of wealth and, therefore, is in position to devote all of his time, if need be, to the service of his country.

Francis Peabody graduated from the Sheffield Scientific School of Yale in 1881. His first experience was as bank messenger; then he became a traveling salesman. He soon saw the fallacy of getting rich on a salary; so in 1883 he embarked in the coal trade, his sole assets being a team of white mules and a couple of ancient wagons. That he has made good in every sense of the word is conceded by all who know him.

Mr. Peabody is above all else an organizer. He is largely responsible for the elimination of the destructive price-wars that up to a few years ago seemed destined to ruin the coal business of the Middle West. Although one of the richest coal operators in America, he is a warm

friend of labor and has been active in the recent conferences which have resulted in material advances in miners' wages.

He is optimistic and enthusiastic. The humanitarian aspects of the mine workers command his first interest, and he was among the first to adopt the modern slogan "safety first." He regards the recent legislation in Illinois providing more comprehensive and effective safeguards for the miners as only the beginning of a broad general movement in that direction.

Mr. Peabody has always contended that in the matter of conservation the greatest responsibility rests with the consumer. He regards the meager percentage of efficiency obtained from burning the coal as the gravest menace to the principles of true conservation. It is therefore likely that the new fuel board will put forth every



FRANCIS S. PEABODY
President of the Peabody Coal Co., Chicago

effort to prevent the enormous wastes of fuel that result from inefficient methods of combustion.

He is a member of many of Chicago's clubs and is an ardent golfer. He also holds office in some of the most prominent financial institutions in the "windy" city. He is democratic, unaffected and immediately impresses one with his sincerity. Considering his large interests and the widespread extent of his activities, Mr. Peabody is easily approachable. He is of the "show me" type however, and is quick to differentiate between the man who has legitimate business and the fellow who seeks to waste his time.

It is probable that the new board will be composed of eight or nine members. The coal fields of the United States are so vast that it is almost impossible to even partially represent the various interests with a smaller committee. Mr. Peabody hopes to announce the other members of the fuel board within a few days.

²Fernald (Bureau of Mines, Technical Paper 123) has supplied some descriptive notes regarding the use of coke braize as a fuel in England. According to Fernald, the material is used to some extent in producers for firing brick kilns, and the manager of one important plant of this type has had success with the employment of braize in Mond producers provided with stationary grates.

³Proceedings American Gas Institute, 1914.

⁴Bacon has described some experimental work on the briquetting of coke dust. "Progressive Age," 1912, p. 378.

Anthracite Men Meet Federal Trade Commission

SPECIAL CORRESPONDENCE

The fact that neither the operators of anthracite coal mines, nor the workmen employed in them, have received additional profit as the result of the increase in prices, caused the Senate to adopt a resolution instructing the Federal Trade Commission to ascertain the real facts in the matter. This was well established at the hearing before the members of the Federal Trade Commission in Washington on May 1. Such increases as took place in prices at the mine were attributed entirely to additional costs, arising from higher rates of taxation, expenses of workmen's compensation, higher wages, insurance costs and the increase in price of practically all materials and equipment. The plain inference of the operators' testimony was that the panic price of coal was added in the distribution, which inference was taken up with the jobbers and retailers at the session in which they took part on May 2.

In summing up the existing situation, Governor John F. Fort, one of the commissioners, declared that he saw no reason why the representatives of the coal industry could not get together with the Federal Trade Commission and fix prices. Governor Fort appealed to all present to do their utmost to stop the violent fluctuation of coal prices and to make impossible these occasional periods of unreasonable prices. He said that the man who makes a small but regular profit is by far better off in the end than the man who attempts to make big profits by taking advantage of abnormal conditions. He pointed out that it was not the purpose of the commission to make it difficult for business men, but on the contrary, in view of the difficult conditions which likely must be faced during the coming months, the desire to be liberal and helpful is stronger than ever.

Several operators testified as to the enormous increase in costs. W. H. Williams, of the Delaware & Hudson Co., produced figures to show that the cost of supplies had increased 26 per cent. during the past year.

The hearing opened with explanations of the experience of the operators under the Pennsylvania Workmen's Compensation Act and the relation between the present law and the prior Compensation Act. The consensus of opinion was evidently that the new law was beneficial, but that as much as 20 years must elapse to establish the law of averages so as to determine the exact costs of its operation.

The commission endeavored to ascertain some practicable means by which the tonnage tax could be refunded to consumers in case it was found to be unconstitutional. Some of those present were of the opinion that this refund would be an unexpected bonus which would be retained by the jobber or the retailer. The commission asked if the refund would be passed along to the consumer in case it was deducted from the current selling price of coal. It was intimated that this would be as equitable as any method of refund, assuming that more or less the same purchasers bought coal each year.

The matter of increased cost of material and the practice by which costs of improvement were charged into the accounts brought forth considerable discussion. It was denied that there had been any great unloading of costs during 1916.

John T. Dempsey, of the United Mine Workers, declared that the labor shortage was confined almost entirely to the common labor about the mine. He said there was no shortage of men who cut coal. Those present at the conference were:

E. R. Brevoort, of F. A. Potts & Co., New York; H. M. Search, of the Anthracite Coal Operators Association, Bethlehem, Penn.; Alan C. Dodson, of Weston, Dodson & Co., Inc., Bethlehem, Penn.; A. B. Jessup, of G. B. Markle Co., Jeddo, Penn.; E. M. Reynolds, of Lehigh Coal and Navigation Co., Philadelphia, Penn.; Thomas Kennedy, of the United Mine Workers of America, Hazleton, Penn.; James Matthews, of the United Mine Workers of America, Shenandoah, Penn.; Daniel B. Wentz, of the J. L. Wentz Co., Philadelphia, Penn.; Arthur F. Rice, commissioner, retailer, of New York; C. H. Jacobs, of Whitney & Kemmerer, Philadelphia, Penn.; S. D. Warriner, of Lehigh Coal and Navigation Co., Philadelphia, Penn.; Morris Williams, of Susquehanna Coal Co., Philadelphia, Penn.; L. A. Tompkins, of Lehigh Valley Coal Co., New York; W. H. MacEwan, of Philadelphia & Reading Coal and Iron Co., Philadelphia, Penn.; G. N. Wilson, of Lehigh Valley Coal Sales Co., New York; S. B. Thorne, of Thorne Neale Co., New York; John T. Dempsey, of United Mine Workers of America, Scranton, Penn.; A. M. Fine, of the Hudson Coal Co., Scranton, Penn.; W. H. Williams, of Delaware & Hudson Co., New York; F. M. Chase, of Lehigh Valley Coal Co., Wilkes-Barre, Penn.; Edward W. Parker, of Anthracite Bureau of Information, Wilkes-Barre, Penn.; John W. Crooks, of Pardee Bros. & Co., Lattimer Mines, Penn.; G. S. Chadwick, of Philadelphia & Reading Coal and Iron Co., Pottsville, Penn.; J. F. Bermingham, of Delaware, Lackawanna & Western R.R., Coal Dept., New York; F. E. Zerbey, of Kingston Coal Co., Wilkes-Barre, Penn.; W. S. Jenney, of Delaware, Lackawanna & Western Railroad Co., New York; George J. Eltz, of Theoford Eltz Coal Co., New York; John W. Whiteley, of Whitney & Kemmerer, New York; W. C. Johnson, of Lehigh & Wilkes-Barre Coal Co., Wilkes-Barre, Penn.; Percy C. Madeira, of Madeira Hill & Co., Philadelphia, Penn.; W. A. May, president of the Pennsylvania Coal Co., Scranton, Penn.; F. H. Wulintrock, of Philadelphia & Reading Coal and Iron Co., New York; C. F. Huber, of Lehigh & Wilkes-Barre Co., Wilkes-Barre, Penn.; W. A. Clark, of New England Coal Dealers' Association, Boston, Mass.; M. R. Scheneck, of J. Skidmore's Sons, New York; John Markle, of G. B. Markle Co., Jeddo, Penn.



Possible Substitutes for Dynamite

The high cost of glycerin is making inventors look around for cheaper substitutes for dynamite, and some believe that there is a prospect of securing such an explosive in nitrostarch. It is claimed for that explosive, that it is insensitive to shock and that it can only be exploded by a fulminate detonating cap. Fire will not explode it. It is believed to be adaptable to a wide range of uses, and when reasonably well compounded and handled with ordinary care, it will not produce fumes that are injurious.

For many purposes, the lightness of the explosive, when it is not specially compacted, is in its favor. It is alleged that changes of temperature do not affect it as they do dynamite, and that it does not absorb water. With all these good qualities, it is believed that it can be made not only more cheaply than any other explosive, but at the same time that it will be reasonably stable.

Nitrostarch has the advantage of being more bulky than dynamite unless artificially compressed, and when powdered, wetting will render it temporarily inert. Nitroglycerin has held its own for a number of years, but it is quite possible that it will be superseded by cheaper, safer and less injurious explosives. The field is large and will repay careful investigation. Whether nitrostarch is the coming mine explosive depends partly on the length and duration of its flame, details that apparently have as yet not been the subject of careful experimentation.

War Sidelights

Under this heading in Coal Age each week we hope to publish items relating to war measures as they affect the coal-mining industry. We earnestly invite all our readers to send us interesting notes covering happenings which bear on the war, either in a military or an industrial way.—Editor.

Flag-raising exercises were conducted at the No. 9 colliery of the Pennsylvania Coal Co. at Hughestown, Penn., on Apr. 28.

Thomas Johnson, one of the chief owners of the Lorain Coal and Dock Co. at Columbus, Ohio, will show his patriotism by placing 766 acres of land under cultivation this summer.

J. F. Bermingham, President of the Delaware, Lackawanna & Western R.R. Coal Department, is a member of the Executive Committee of the Food Problem Committee of the Merchants' Association.

The Stanton colliery of the Lehigh & Wilkes-Barre Coal Co. was the scene of a stirring patriotic meeting recently, when the officials and employees raised a beautiful flag above the workings.

Miners in Logan County, West Virginia, who are thinking of volunteering for service in the United States Army are urged by Logan County operators to remain on the job as a patriotic duty until they are called to arms.

The dedication of the buildings of the U. S. Bureau of Mines, adjoining the Carnegie Institute of Technology in Schenley Park, has been postponed until the war is ended. The ceremony had been set for Oct. 3, and the event was to have been made a notable one.

The Connellsville high school has been notified that Clay F. Lynch, general superintendent of the H. C. Frick Coke Co., has given \$150, divided into three prizes, \$75, \$50 and \$25, to the high-school boy raising the largest crop of potatoes during the summer.

The outside laborer will find it hard to live even after he receives the advance in wages recently granted. The prices of the ordinary foods are beyond his reach. Flour is \$16 per barrel, potatoes \$5.60 per bushel, butter 50c. per pound, and meats are priced higher each week.

A conference has been held by the Russian Minister of Commerce looking to the matter of a Government coal monopoly, and it was proposed to place all fuel at the disposal of the new Russian Government so as to regulate the distribution. The coal representatives at the conference made no objection. The date set for putting in force the new plan was May 1.

Jamison Coal and Coke Co., Greensburg, Penn., is encouraging its numerous employees to make gardens. Prizes aggregating about \$200 will be awarded for the best vegetable garden. The company plows the land for its employees and in some cases even furnishes the seeds for planting.

W. D. Vanhoosier, for the last six years a local policeman, has been appointed watchman of one of the mines of the Miami Coal Co., Clinton, Ind. The mines are to be guarded closer than ever before, in view of present conditions. Local mine owners have placed double watch about the mines, both day and night.

In order to encourage their employees to cultivate their home gardens, the Dodson Coal Co., operator of the Morea colliery, is having the gardens plowed for its tenants and is providing free fertilizer. The men at the Beaver Brook colliery of this company contributed enough money to maintain an ambulance in the American Ambulance Corps abroad.

The authorities at Washington have asked the railroads in the Central West to do everything possible to expedite shipments of coal and iron ore arising from the opening of Lake navigation. Last week the Pennsylvania R.R. was a heavy buyer of spot coal in the Pittsburgh district, and deliveries are still being made. It is understood that this was done to have more cars for service in the Lake trade.

On Monday evening, Apr. 23, six additional watchmen were placed on night duty at the Lytle colliery of the Lytle Coal Co. On the following Wednesday one of these men found a fire beneath the "car load" steps and saved the colliery from damage. It will doubtless be necessary in the near future to establish the previous employment status of new men applying for jobs at the collieries.

A meeting of the executive committee of the Coal Mining Institute of America was held in the office of W. E. Fohl, Farmers Bank Building, Pittsburgh, Penn., on Thursday afternoon, May 3. The primary object of the meeting was to consider the advisability of having a special summer meeting of the Institute to discuss questions which have arisen or may arise on account of the war situation.

Local authorities believe that the dynamiting of the house of Vincenzo Laverdi, at Yatesville, Penn., may be charged to the Industrial Workers of the World, whose antipathy was aroused by Laverdi's promoting a flag raising at the Fernwood shaft of the Hillside Coal and Iron Co. The house was considerably damaged, but no one was hurt. The Fernwood colliery is near Boston Settlement, an I. W. W. stronghold.

Officials of the Lehigh Valley Coal Co. conducted a flag raising at the Buck Mountain colliery, Weatherly, Penn., on Apr. 28, which was marked by an especially significant patriotic program. From this mine in the 60's came the coal with which the engines of the "Monitor" were driven to victory in the first battle between iron-clads. On this account the flag raising had special significance to the men of the Lehigh Valley Coal Co.

The New York Towboat Exchange, Inc., has adopted resolutions pledging its support to President Wilson and the Government and "state our desire to be of such use, both ourselves and our Exchange, as he and the Secretaries of the Navy and the Army and the other several departments of the Government may find will be for the best interests of the United States." The members of the Exchange own more than 2000 tugs, lighters and other craft.

H. B. Swoope, of Madera, Penn., gives evidence of a true spirit of patriotism. He has written the Navy Department offering a cargo of coal from his mines each month free, and has stated that any of his employees who enlists for active service will have as good a job on his return as that which he leaves; that any dependents of the enlisters who may need help he will look after personally, and that he himself will enlist if needed provided the age limit is changed.

The Chamber of Commerce of Philadelphia has received information from Amsterdam that Holland is now in the market for large quantities of mining machinery. A fuel shortage has existed for many months, and the mines at Limburg have been unable to meet the demand, although worked to a greater extent than ever. A corporation with large capital, which has been formed to operate coal fields heretofore undeveloped, is in the market for heavy purchases of machinery.

A corporal of the 13th Infantry, in charge of a squad on duty on the Keyser Valley mine belt on Apr. 27, arrested a man, late at night, in the water-shaft tower of the Central mine of the Delaware, Lackawanna & Western R.R., Coal Department. This shaft drains five mines, the Sloan, Hampton, Continental, Hyde Park, Archbald and Central collieries, five of the biggest anthracite producers of the Lackawanna company. The prisoner gave his name as Sophia Kitguard, 32 years old, of Denmark.

"I want to remind the miners of the Hocking district that war is upon us," said Subdistrict President Sanford Snyder, on his return from the New York conference, commenting on the increase in wages granted the miners. "We, as mine workers, must do our part. The wartimes and war prices resulted in the wage increase. I want to urge every miner, every man employed about the mines in the Hocking district, to be loyal to the new contract. When there are cars at the mine to be loaded every man should be there to see that they are loaded."

The difficulty which coal operators and other employers of labor have had in getting and keeping a sufficient number of men for their requirements has caused the West Virginia State Council of Defense to direct Gov. John J. Cornwell to have a census taken of all unemployed and

idle males in the state between the ages of 16 and 60 years, as a means of increasing the industrial and agricultural productiveness of the state. When this is done means will be considered of eliminating idle men by giving them the alternative of working or leaving the state.

All coal operators in western Pennsylvania have received a note of warning from United States District Attorney E. Lowry Humes asking an immediate stiffening of guard methods over explosive magazines.

The Consolidation Coal Co. has had copies printed of the President's proclamation concerning the need of the country in the way of growing crops this summer and has distributed them among its employees. This company has offered larger prizes than ever for the best gardens made by their employees at the various mines.

Prominent coal men of the state, including M. H. Taylor, chairman of the board of directors of the Pittsburgh Coal Co., Pittsburgh, Penn., and S. P. Hutchinson, president of the Westmoreland Coal Co., Philadelphia, Penn., are active in a movement to secure funds to donate and maintain ambulances in the American Ambulance Corps with the French army. The cars so given will be divided between the American Ambulance Field Service and the Paris section, which latter is attached to the American Ambulance Hospital in Paris. They will bear a nameplate reading "Coal Trade of the U. S. A.," it being customary for donors' names to appear in this way.

The anthracite operators and miners, the latter through John P. White, international president of the United Mine Workers, have offered to do all in their power to maintain a coal supply to meet the nation's needs. A resolution to this effect was adopted by the joint wage-scale committee of operators and miners and signed by S. D. Warriner, chairman of the operators' committee, and Mr. White for the mine workers. It reads:

Be it resolved by the coal operators and mine workers represented in the anthracite joint conference, that we hereby instruct the Conciliation Board to offer its services to the Council of National Defense, to render such assistance to the council in maintaining the production of coal and in enlisting the maximum coöperation of employers and employees represented in the anthracite coal industry so as to meet the requirements and needs of the Government as set forth by the Council of National Defense, and also to provide for public necessities.

William B. Jess, president of the Springfield District Coal Co., Springfield, Ill., says that there will have to be an immediate advance in the price of coal in the Springfield district, partly on account of the advance granted to the miners and partly because of the war prices for materials and supplies required in and about the mines. These, he says, have advanced in a short time from two and a half to eight times the former prices. Mine mules, which formerly could be bought for \$150, now cost more than \$300. Mining machines, which could be purchased for \$1800, now cost from \$3700 to \$4800. The Central Illinois Operators' Association and the Illinois Operators' Association will meet in a few days, and it is expected that a joint meeting of these and the Fifth and Ninth District Associations will be held later to decide on concerted action. The advance in the market prices of coal, thus decided, will be put into effect as soon as possible.

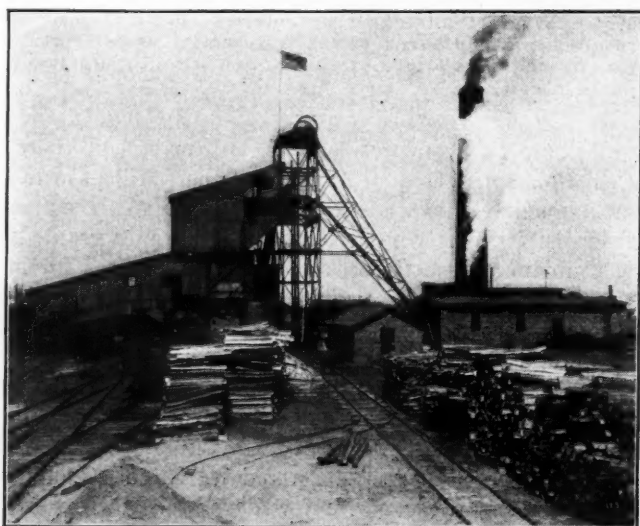
A conference of a national defense committee of operators and miners, to be held in the early part of May at Indianapolis, probably at the headquarters of the United Mine Workers of America, will cooperate with the Council of National Defense in increasing coal production. Phil Penna, J. C. Kolsem and Edward Stewart received notice on Apr. 26, of the intention to call the meeting. Penna and Kolsem are of the operators, while Stewart is president of District 11, United Mine Workers of America. Other members of the committee of ten from the bituminous field are H. S. Robbins, of Ohio; C. M. Moderwell, of Illinois; Frank Farrington, of Illinois; John Moore, of Ohio; Philip Murray, of Pennsylvania, and William Green, secretary of the international union. The purpose of the organization of the committee is to offer the services of the bituminous coal-mine industry to the Council of National Defense, cooperating with it in its work and maintaining the production of coal at the highest point.

The Western Kentucky Conservation Association, Madisonville, Ky., C. E. Reed, secretary, has sent out the following circular:

All Members—In conversation with an active representative of one of our operating companies a few days ago, I was much impressed with what he has done for his employees in regard to relieving the burden of the high cost of produce. This man stated he had a considerable acreage of uncultivated ground in the vicinity of the homes of his men; that he had furnished some teams and had plowed up all this space that the employees might have vegetable gardens.

This seems to me a most excellent idea and one that could possibly be adopted by almost all of our members, and I would urge everyone who has any such land available to follow this precedent. In so doing you will be cooperating in a most practical way with the Government officials in their efforts to increase the food production of the country. Get your employees together, or in some way convey to them the necessity of their cultivating gardens, and endeavor to instill into them the spirit of thrift.

Aside from cooperating with the Government, possibly a great good may accrue to the industry by creating a better feeling among the employees; this action may even have a restraining effect on those of a roving disposition. The season is upon us, and if this suggestion appeals to you, you will appreciate the importance of prompt action. I will be interested to know what our members may be able to accomplish in this direction.



"OLD GLORY" SHOULD BE FLOATING OVER EVERY MINE IN THE COUNTRY JUST AS IT IS HERE OVER THIS CROWN HILL MINE OF THE CLINTON COAL CO., IN INDIANA

Coal Mines Must Run in Time of War

In view of the legislation now pending in Congress, which has for its object the raising of the United States Army, the following extract from the monthly review of the U. S. Bureau of Labor Statistics for April, 1917, which refers to a recent report on the effect of the war on the coal-mining industry in Great Britain, is illuminating. The report referred to shows that the coal production of the United Kingdom in the fiscal year ending July 31, 1916, was nearly 10 per cent. less than in the fiscal year 1913 and 1914. The review of the Bureau of Labor goes on to say:

In order to turn the decrease of output into an increase it was found necessary, under certain conditions, to arrest the recruiting of miners and to provide for the replacement of those already in the army. At the end of March, 1916, 282,200 had joined the colors, but the replacement numbered 116,900, leaving a net reduction of 14.8 per cent. of the labor at the outbreak of the war. On June 16, 1916, the Government prohibited all recruiting from miners and decided further that all miners in the ranks of home-service units, who were unfit for foreign service, should be returned to the mines, which would, it was estimated, make available between 15,000 and 16,000 workers and add about 4,000,000 tons to the output.

A serious factor with which the Government has had to cope is the large amount of absenteeism due to avoidable causes, which, if wiped out, would add, the committee estimates, about 14,000,000 tons to the total production. The report notes little encouragement along this line. It is stated, however, that a reduction of nearly 1 per cent. in the absenteeism, as compared with the pre-war period, represents about 20 per cent. on the avoidable absenteeism, that the collieries have worked more days, and that the men who joined the forces were among the young and strong of the miners, the men who have come into the mines not being their equal in point of endurance. An effort is being made to reduce absenteeism by the appointment of "absentee" committees at the mines, but no tangible results are noted.

So far as days lost by collieries is concerned, the first quarter of 1916, according to the report, shows up better than any other of the 10 preceding quarters. Thus the days lost per week in the first quarter of 1913, 1914 and 1915 were 0.53, 0.40 and 0.41 respectively, while in the first quarter of 1916 the number was 0.29. Holidays are given as the chief cause of lost time, but these, it is stated, have been reduced about 50 per cent. as compared with pre-war days.

COMING MEETINGS

Kentucky Mining Institute will hold its spring meeting May 18 and 19 at Lexington, Ky. Secretary, J. W. Read, Lexington, Ky.

Illinois Mining Institute will hold its next meeting on May 17, 18 and 19, at La Salle, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society for Testing Materials will hold its annual meeting June 26-30 at Atlantic City, N. J., with headquarters at Traymore Hotel.

International Railway Fuel Association will hold its annual meeting May 14-17 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

Canadian Retail Coal Association will hold its annual meeting at Toronto, Ont., Canada, June 14 and 15. Secretary, B. A. Caspell, Brantford, Ont., Canada.

American Society of Mechanical Engineers will hold its spring meeting May 21-24 at Cincinnati, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Mine Inspectors' Institute of the United States of America will hold its tenth annual meeting July 10-13 at Indianapolis, Ind. Secretary, J. W. Paul, Bureau of Mines, Pittsburgh, Penn.

American Institute of Electrical Engineers will hold its spring meeting June 25-30 at Homestead Hotel, Hot Springs, Va. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

American Institute of Chemical Engineers will hold its semiannual meeting June 20-22 at Buffalo, N. Y. Secretary, J. C. Olsen, Cooper Union, New York City.

American Society of Civil Engineers will hold its annual convention in the "Twin Cities," St. Paul and Minneapolis, Minn., June 12-15. Secretary, C. W. Hunt, 220 W. 57th St., New York City.



Lest We Forget!

By Rufus T. Strohm

Written expressly for Coal Age

About this season of the year, when hurdy gurdies first appear, when baby flies and gnats and things begin to flap their virgin wings, and young men's fancies lightly turn to thoughts that cynics coldly spurn, then father heaves a thankful sigh and lets the furnace fire die.

He trundles out the final can of ashes for the garbage man, and as he shuts the empty bin his face is broadened by a grin. He hangs the poker on its nail, pulls out his shriveled wad of kale, and peels sufficient from the roll to pay the latest bill for coal. Then blithely on his way he goes, because he positively knows there are no fuel bills to meet while summer rashly squanders heat.

He wastes his coin on leghorn hats and rainbow tinted silk cravats, goes in for golf and kindred sports, and frequents all the swell resorts, while colonies of spiders spin their webs across the fuel bin.

Alas! His foresight never goes beyond his wide plebian nose, and memory lies stark and dead within his foolish, witless head. He quite forgets that yester-year, when grass grew brown and leaves grew sere, and early autumn's biting breeze brought chatters to the teeth and knees, then folks who felt its warning chill went frantic in their haste to fill their cellars and their bins with coal and faced a prospect far from droll. For when they ordered it, they found not half enough, to go around, and though the prices rose, egad! It simply wasn't to be had.

As colder still the weather grew, full many a dainty nose turned blue, while some unlucky people froze their ears and finger-tips and toes. This summer, should folks seem to make the same unfortunate mistake, let's hope that some time in July a raw and chilly wind drifts by to break the round of sun and sweat—lest we forget! lest we forget!



Malicious Misrepresentation in the Public Press

Under the caption, "Government Requires Reduction in the Price of Coal," the Newburgh (N. Y.) *News* recently made the following statement:

Anthracite Trust announced some weeks ago it would not make the customary reduction in the price of coal this spring. The department of justice in Washington told the trust it would better make the reduction or there would be something doing. The department said there was no apparent reason why the reduction should not be made. The trust at once changed its attitude and at a meeting of coal officials in Philadelphia this week arrangements for a 50c. cut were made. The department of justice is very brave in dealing with the Anthracite Trust but it goes to sleep while the Gasoline Trust forces its exactions on the public, no longer with any pretense there is a reason for it except greed.

The only trouble with the paragraph just quoted is that every sentence is a misstatement. It serves to illustrate to what an extent the public is misled by the mendacious utterances of irresponsible newspaper writers. In the first place, the reference to the "Anthracite Trust" is a false premise, as has abundantly been proved by the results of numerous investigations that have failed completely to show the existence of such a trust. Secondly, there was no concerted action of any kind in the announcement of a withholding of the spring discounts this year. The only announcement of the kind made was by one of the individual operators, on his own initiative and entirely independent of what action other companies might take.

In the third place, the Department of Justice in Washington made no utterance and took no action whatsoever. The Federal Trade Commission, which is independent of the Department of Justice, did, however, take cognizance of the circular letter issued by the individual operator, but only to the extent of saying that from the records in its possession such action was not justified on the ground of any increased cost in production. It did not say there was no apparent reason why the reduction should not be made, nor did it say that "the trust would better (save the phrase) make the reduction or there would be something doing." The fact is that the action would have been justified entirely by trade conditions and by the law of supply and demand.

Nor did "the trust at once change its attitude." The Philadelphia & Reading Coal and Iron Co., acting independently, announced on Mar. 27 that the usual discount of 50c. a ton would be allowed for April. It made no announcement as to what its action would be for the other months in which it has been customary to make reductions. Some of the companies followed the Reading lead, while still others have made different reductions; some have made no announcement at all. There has been no concerted action of any kind in the matter.

And, finally, it was not the Department of Justice but the Federal Trade Commission that conducted the investigation of the gasoline industry, as it did of the print-paper industry, and of the coal-mining industry, both anthracite and bituminous.

Death of Minor Employed as Trapper—A coal operator may be held liable for death of a boy under sixteen years of age employed as trapper in violation of law and fatally injured through negligence of a motorman in driving a car through a door without waiting for decedent to open it; \$5000 is not excessive recovery of damages in such case. (Kentucky Court of Appeals, *Love vs. Carter Coal Co.*, 190 Southwestern Reporter, 481.)

The Labor Situation

General Labor Review

The mine workers are showing their patriotism in an exceedingly practical way. They are working steadily almost everywhere, and there are few strikes to record. There should, of course, be none, but that would be almost too much to ask of human nature.

The strike at Larksville, Penn., in the northern anthracite region, is an exception to the general rule. The mine workers of the Delaware & Hudson Co. at that point have declared a button strike, because 20 of the men working there have not paid their union dues.

Only Steady Work at High Pressure Is Needed

The patriotic duty of every mine worker will require him to work every weekday for a full 8 hours per day. This can be done at high pressure without any undue draft on his powers. There is no call for any further exertion. Any attempt to do more is apt only to result in reduced output, and a certain "staleness" from which the workman only slowly recovers after the experiment has been attempted.

This argument is made rather from patriotic reasons than from a consideration for the comfort and pleasure of the workingman. If it were advisable for the purpose of supplying the real needs of the nation, it is certain the miner would donate the exertion and do his extra bit. But as a matter of fact there is little a man can do after an honest 8-hour day without taking the necessary energy from the days which follow.

On Apr. 25, for the first time in the anthracite field, some Spaniards were brought in to work in the mines to satisfy the shortage of labor. Even the Slavs have been leaving the mines lately, and it is hard to maintain the tonnage with such a scarcity of men as now exists.

Let Us Hope Central Pennsylvania Is Satisfied

The central Pennsylvania district conference has been treated elsewhere. The mine leaders appeared to concede that the increase should only be 20 per cent., and the operators were quite willing to give that increase. The men in the field, however, showed their antagonism to any such settlement, and they succeeded in getting a larger advance, to which they were not entitled. They also managed to secure free collection of union dues. Despite the urgency of their demand they could not budge the operators on the "car pushing" question and every man is still obliged to accept his car at the mouth of the room and is required to deliver it loaded at the same point.

Somerset County troubles are quieting down. The Maple Ridge Coal Co., operating two mines near Holsopple, continues to be the only company with a strike, and even this company is operating with depleted forces. The output is slowly gaining and is now about 100 tons per day.

More Details of the Hicks Mine Settlement

The Pittsburgh district is working as steadily as the small coal supply will permit. There is absolutely no labor trouble in the union districts with which must now be classed, as briefly noted last week, the Hicks interests in the Kiskiminetas valley.

President Philip Murray, of the United Mine Workers, has stated that the strike area in the district is reduced 50 per cent. by the agreement and that the advance is in the neighborhood of 35 per cent. on previous wages. Pick mining, formerly 55 to 76c. per ton, is now to be paid 65 to 88c.; machine loading, formerly paid 31 to 47c. a ton, is now 45 to 59c.; cutting, which was 6 to 13c. a ton, is now raised and is paid from 9 to 16c. All outside and inside day labor shares in the increases. The companies affected are: Saltsburg Coal Mining Co., Paulton Coal Co., Armstrong County Coal Co., Haddon Coal Co., Aladdin Coal Co., Avonmore Coal Co., Valley Coal Co., Leechburg Coal and Coke Co., Gilpin Coal Co., Maher Coal and Coke Co., Park Coal Co., Pine Run Coal and Coke Co., West Penn Mining Co., Bagdad Coal and Coke Co. and Bowman Coal Co.

Coming after a long strike of 13 months and involving a large number of men, this is quite a victory for the union. Russellton, Harwick, Valley Camp and Superior signed up

several months ago. The rest of the district is quite likely to follow, and then probably the union will endeavor to extend the confines of the unionized area toward the southeast, where a large nonunion territory exists.

In West Virginia a coal company operating at Bream, just northeast of Charleston on the Elk River and the Coal & Coke R.R., has signed the same working agreement with the union as that in operation in the unionized Kanawha region.

Four other companies operating on Cabin Creek and along the main line of the Chesapeake & Ohio R.R. are also reported to have signed the agreement, in each case giving the employees a substantial increase in pay and an 8-hour day. Miners employed by the Jackson Salt and Coal Co. at Hartford City were reported on strike, Apr. 25.

Mother Jones is working in the New River field, apparently with much success. Eccles, Wickham and Sullivan are recent points of her activity. Peggy Dwyer is associated with her in her canvass for members.

Illinois Coal Mines Go on Sympathy Strike

In Montgomery County, Illinois, the United Mine Workers are undertaking a sympathy strike to compel the unionization of a plant not connected with the coal industry. Miners at Hillsboro, Kortkamp, Nokomis and Witt have struck in an effort to make the Schram Glass Co., of Schram City, recognize a union that has been formed by its employees. The glass company workers struck six weeks ago, the 300 employees demanding recognition and an increase of wages.

On Apr. 25 the company imported workmen from St. Louis. A mass meeting was held that night, and a resolution was adopted in favor of closing every mine in the county until the imported men were sent away. The next morning some of the miners appeared at the mines, but strike pickets sent them back home and the mines are idle. The coal miners are said to have instigated the efforts to unionize the Schram plant, and the miners' union has been contributing to the support of the Schram strikers. Not all of the miners are in sympathy with the innovation, however, and some are said to be contributing to the relief fund against their wishes.

Hard Time Keeping Policemen Out of Mines

The Civil Service Commission of Springfield, Ill., confronted by the danger of impairment of police and fire department forces by desertion to the coal mines, has adopted a resolution that employees of these departments who take leaves of absence for more than 30 days will be placed at the bottom of the civil-service list. Heretofore it has been the rule to grant leaves for six months. High wages at the mines have caused so many policemen and firemen to take leaves that the new rule was deemed necessary.

A joint meeting of the coal miners and operators of District No. 8, United Mine Workers of America, closed shortly before noon Apr. 24, when an agreement was reached by which the screen-coal pick-mining scale in the "block" coal district was raised to \$1.27½ per ton. The miners were demanding an increase of 17c. on the screened-coal basis, which they claimed would be equivalent to the 10c. raise granted on the mine-run basis. The operators refused to grant more than an increase of 12½c., and this was finally agreed upon.

In framing the new machine-mining scale for screened coal, the machine runners were given 3½c. of the increase, which makes their scale 29½c. a ton, while the loaders get the remaining 9c., which makes their scale 73½c. a ton. The men will receive an advance of a little more than 60c. on the day's work.

The largest strip pit in the State of Indiana, located at Clay City, has signed up with the union. The agreement gives the workmen all the provisions of the strip-pit agreement in force in District 11, including the 8-hour day, closed shop and the check-off.

The Curtis Coal Co., of Colorado Springs, has made a working agreement with James F. Moran, acting president of Colorado (District 15). The mine of this company employs 150 men. The agreement is based on that with the Victor-American Fuel Co. and provides not only the standard union provisions, but wage increases proportional to those recently granted in Illinois.

The 600 mine workers at the mines of the Carbon Hill Coal Co., Carbonado, Wash., are on strike; they demand the removal of John McDowell, the mine superintendent. The mine workers allege that McDowell is not fit for his position, as is shown by the fact that he ordered four men to enter a gaseous part of the mine with open lights. The company officials say that McDowell is a fit man for the position and declare that they will retain him regardless of the demands of the mine workers. They also urge that the strike is a violation of the agreement between the operators and the men. The mine workers say that the mine will stay closed for two or three months before they will return to the mine with McDowell in charge, and Martin J. Flyzick, the district president, appears to be supporting their attitude.

In Alaska, Governor Strong has signed a bill providing an 8-hour day for all underground workers in the territory. It is said that the bill has been opposed by the patentees of coal lands who are contemplating opening mines in the Matanuska and Bering River coalfields.

Wage-Scale Readjustments

The mine workers of central Pennsylvania have at last completed an agreement with the operators, obtaining a wage scale from 20 to 30 per cent. higher than their contract wage. They were only entitled to 20 per cent., and it is to be hoped that it will not prove that a differential has been set up against the middle of the state to the benefit of the rest of the central competitive region. The demand for the abolition of car pushing was withdrawn, but the operators agree to collect union dues without charge. The agreement is subject to ratification by the miners, and they met in Du Bois to discuss it yesterday, May 4.

The anthracite agreement has given the union much satisfaction. It reflects much credit on both mine workers and operators—on the part of the mine workers, because of their generous consideration of those in the ranks who are paid the lowest wages, and on the part of the operators, because they broke a contract to their own disadvantage when they saw that it worked a hardship on their employees. The day laborers have always complained that the agreements were not so favorable to them as to the miners and have desired a leveling of conditions.

White Says Operators' Action Is Creditable

J. P. White, the international president of the United States Mine Workers, made the following statement regarding the new anthracite agreement:

The settlement concluded with the anthracite operators tonight, carrying with it an increase in wages for the workers in the mines of from 11 to 35 per cent., should be as gratifying to the executives and populace of the nation as it will be to the men affected.

Like the bituminous settlement negotiated last week, the outcome of the anthracite negotiations most forcibly emphasizes the wisdom of collective bargaining in time of peace or war.

Anthracite operators were invited to meet representatives of anthracite mine workers following the consummation of the bituminous wage increase, which was occasioned solely because of the extraordinarily high cost of living. To the operators' credit it may be said that they responded promptly, and in a spirit of consideration of unusual conditions they agreed to reopen every wage provision of the anthracite contract.

Representatives of the operators and miners who were charged with the responsibility of negotiating the 1916 agreement during the past five days have most diligently applied their efforts in an endeavor to solve justified wage increases based upon the various classified conditions of employment and rates of pay prevalent in the anthracite coal regions.

I feel confident that the agreement reached will alleviate the sky-rocketing cost of food and clothing products sufficiently to tide the mine workers of the anthracite industry over an unprecedented crisis.

Regards Result as Indorsement for Unionism

The signing of the anthracite agreement tonight, following the bituminous settlement, insures industrial peace in the basic industry of the nation, all of which has been accomplished without threat, suspension of work, strikes or interference from any outside source other than the recognized councils for wage adjustments provided for in the joint wage agreement.

What better recommendation can the opponents of trades unionism seek to convert them to the sane policy of collective bargaining than is typified by the agreements reached by the anthracite and bituminous coal industries during our present crisis.

Thomas Kennedy, president of District No. 7, commenting on the new agreement, had this to say:

The increase in wages secured for the anthracite mine workers as a result of the conferences between representatives of the miners and operators is the largest increase ever secured for the mine workers. The increases range from 11 to 35 per cent. on some rates.

The matter was handled in a commendable manner by both miners' and operators' representatives. President White, of the miners' organization, is deserving of great credit for the manner in which he conducted the negotiations and brought them to a successful conclusion.

The operators have been particularly anxious to prevent the day workers from migrating to the munition works, and as a result they are well pleased that the discriminatory features in favor of the mine workers were introduced. In fact the anthracite operators have been suffering much from competition with the Bethlehem steel works and the munition plants, and so the increased wage commended itself almost as a politic move.

In western Pennsylvania and Ohio there was the same competition for labor. The eastern Ohio mine workers were leaving for the iron and steel mills, and the Hocking Valley men had been flocking to the Akron rubber factories. The rise in wage will more or less correct this to the advantage of the mine operators, though perhaps not to the betterment of the belligerent standing of the nation.

Of course, the settlements already made will be followed by readjustments elsewhere. The operators fully realize this and are interposing no objections. On Apr. 24 a meeting of the members of the Southwestern Interstate Coal Operators' Association was called for Friday, Apr. 27. The association is representative of the ownership of 300 or 400 mines in Kansas, Missouri, Oklahoma and Arkansas, the districts included being known as Nos. 14, 21 and 25. About 40,000 miners work in these mines, and the union is nearly 100 per cent. strong. On May 2 the representatives of the miners asked for an adjournment of the conference as two of the committee men representing the miners were unable to be present. Presumably they are attending the meeting at Des Moines, Iowa, which was also postponed until Friday, May 4. Seven mines in the Spadra, Ark., field have been closed down by a strike, the miners demanding a restoration of the 1916 prices on mining supplies.

Western Kentucky Scale Already Granted

The Western Kentucky Coal Operators' Association granted a flat increase in wages of 20 per cent. to its employees at a recent meeting held in Louisville, the increase to become effective last Tuesday, May 1. The operators were asked for an increase last winter when coal made such a sensational advance. They refused at that time, urging that the high prices were only for uncontracted coal and that much of the product of their mines was on long-time contracts, which were taken at low figures. As a result of this earlier refusal the mine workers were somewhat surprised to be notified of the increase which, however, only places western Kentucky in unchanged relation to her principal competitors in Ohio, Illinois and Indiana.

On the Pacific coast the operators claim that prices for coal have not soared so much as in the East, and they also declare that they are not moved like Eastern operators to give increases, because conditions in other industries are not so prosperous as to lure away the mine workers. However, the miners for their part may argue that the men in the competing Canadian fields have been recipients of large wage increases. Furthermore, the competition with Australian coal has been relieved by the scarcity of shipping, so there remains only the competition with oil to prevent the operators from facing a wage readjustment with perfect composure.

Miners Show Their Patriotism

The officials of the eastern Ohio subdistrict, on Apr. 23, distributed the following circular, which does them no little credit and proves that they, like the international board officials, are actuated by the noblest of patriotic sentiments:

The situation confronting us at the present time is so serious that we deemed it wise and expedient to issue this circular of information.

Our country is in a state of war, and whatever our personal opinions or feelings may have been, we each now have a certain duty to perform. Having had the opportunity to gather the information as to what should be done, we feel obligated to impart that information to you. As you will understand, by a meeting held in New York and by mutual consent regardless of the fact that our contract does not expire until one year hence, our organization has been able to obtain one of the largest increases ever received, at one time, in the history of the organization. This increase means nearly five million dollars to the miners of our state. It was made possible for us to get this enormous increase because of the advanced prices of coal, occasioned by the present war.

Anyone Causing Shutdowns Will Be Prosecuted

While in session in New York, the President of our nation issued a statement, calling upon those who are engaged in the production of material, food and clothing, to conform themselves to the present status of affairs in our country and produce to their fullest extent and ability the things needed for the maintenance and support of our nation. Especially did he call upon the miners and farmers to produce to the fullest extent.

Fellow workers! This means that our Government will not tolerate, at this time, any unnecessary shut-downs; it also means that anyone causing same may be prosecuted. So we desire to urge upon you a strict compliance with the terms of our contract. We feel confident and certain that we can settle

any grievance that may arise without the necessity of closing any mines. The men who stay at home, engaged in the production of necessities, are just as valuable to our country as those who are actually engaged in battle.

Therefore, we again advise you to adhere closely to our contract. Do not become engaged in any bitter war arguments and listen to no agitator who may be paid for the purpose of creating turmoil and dissatisfaction. Come to us with your complaints and trouble. You are paying us for this work; give us your confidence and we will, to the best of our ability, try to guide you through this terrible world-wide crisis.

We Must Not Be Selfish; We Must Help Others

There is another phase to this important situation—that is, the production of foodstuffs. In order to live, every available foot of land must be cultivated. The President of our nation and the governor of our state are constantly calling attention to the fact that we are facing a shortage of food. There must be a system of farming established so intensified that we can tide over this critical period. It is now a common occurrence to be refused as much of certain articles as we would like to buy, despite the fact that we are willing to pay cash for it. If this is the situation now, what will it be after we have been engaged in the war? Of what use will money be to us if the things we need to sustain life are not available? We are doing what we can to get a supply of seeds, but, whether or not we get them, do your part by planting everything possible. We must not be selfish and satisfy only ourselves, but must do something for those who have not the opportunity to help themselves.

The miners have always prided themselves upon the fact that they consider an injury to one the concern of all; so now in the cause of humanity, for the sake of our fellow workers, their wives and children, let us do our part. We advise the committees to immediately interview the different superintendents and have them cooperate toward the end that all land around the mines be put into practical use. Let us go at this with vim and vigor. Let us put our heart and strength into it with the thought that we are doing something for struggling humanity. We pledge you our support, our advice

and our cooperation toward the end that there may be no hungry children in our subdistrict during the coming winter.

This, brothers, is a very serious proposition. Do not look upon it lightly, for only the all-wise Providence knows what the future may have for us. Again asking you to come direct to us before taking any drastic action, we are fraternally, etc.

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Kanawha and Central Competitive District Scales Compared

The adjustment in the wage scales of the Central Competitive District will bear even at this late day some further consideration. It would appear at first sight—and first appearances are often quite deceiving—that the Central Competitive District operators proved more liberal in refurbishing a scale still in full force and effect than the Kanawha operators in making a brand new scale. It might be urged with some show of truth that the Kanawha operators in their negotiations secured an advantage to which they were by no means entitled, as they did not pay wages as high as those paid in western Pennsylvania, Ohio, Indiana and Illinois before the increase was provided. In fact, the Kanawha wage scale even after the increase is less than the Central Competitive wage scales before the increase. Now that the Central Competitive District has given a 10c. increase per ton and the Kanawha district has granted only 6½c. increase, the difference already existing between the districts is apparently accentuated instead of decreased.



OPERATORS AND MINE WORKERS OF CENTRAL COMPETITIVE

DISTR

Pick-Mining Rates in the Two Coal Regions

The pick mining run-of-mine rates in the Kanawha district per short ton will be as follows:

Kanawha Thick Vein.....	Cents 55½
Powellton seam.....	52½
Kanawha Hard Coal No. 5 seam.....	57½
Coalburg, Lewiston, Kanawha, Winifrede and Cedar Grove seams.....	63

The pick mining run-of-mine rates as now existing in the Central Competitive District will be:

Thin Vein District of western Pennsylvania.....	Cents 77.64
Eastern Ohio, Hocking, Cambridge and Amsterdam-Bergholz districts.....	77.64
"Bituminous" districts of Indiana and Danville district of Illinois.....	74.00

Kanawha and Central Machine-Mining Rates

In machine mining there is the same inequality. The Kanawha figures run as follows:

Kanawha seam.....	Cents 39
Kanawha Hard Coal No. 5 seam.....	40½
Coalburg, Lewiston, Kanawha and Winifrede seams.....	46½
Cedar Grove seam.....	48½

Compare this with the Central Competitive District:

Thin Vein district of western Pennsylvania and throughout Ohio.....	Cents 60
"Bituminous" district of Indiana (chain-machine mining).....	62
"Bituminous" district of Indiana (puncher-machine mining).....	64
Danville district of Illinois.....	64

However, the coals of the Kanawha region are somewhat easy to dig and are clean. This in a degree at least explains the difference in scale. The man who has a lot of rubbish to stow in the gob of his room is entitled to larger pay per ton

than one who has straight sailing, and the miner who mines a coal which cuts and shoots readily is not entitled to as much as one who works in a tougher seam.

Day Workers Get Most of the Wage Increase

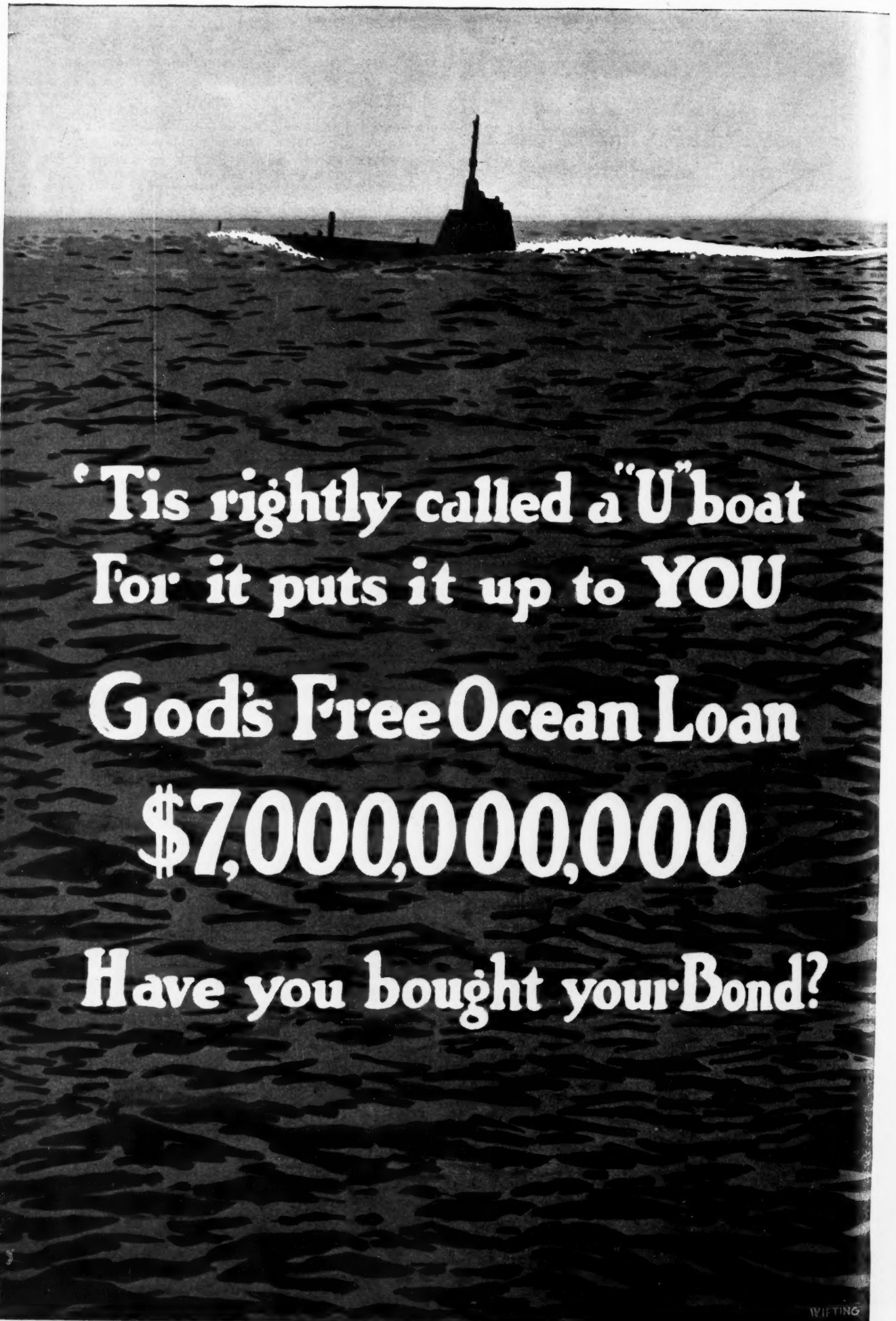
The changes in the Kanawha day wage scale were not so unfavorable to the Central Competitive field. The drivers in fact got a day that was shortened one-ninth and got 70c. more per day, but that increase did not apply to the track-layers or their helpers, who only obtained an increase of 41c. and 56c. respectively. Slate shooters were granted 34c. more than before, and all outside day labor received a 15 per cent. increase. As opposed to these increases the adult day workers in the Central Competitive District received 60 to 62c., a 20 per cent. increase in wage. However, it must not be forgotten that the Kanawha operators had to concede the 8-hour day in place of a day of 9 hours, which is equivalent to about 30c. a day all around.

It would take a close inquiry therefore to discover just how much the readjustment of the day wage has weakened the standing of the Kanawha operators in competing with those of the Central Competitive District. Perhaps when all is considered there has been such a loss as will balance the gain in the digging differential, which gain was 3½c. per ton.

It is to be hoped that there has been no real change in differential created, for business in the evil days was adjusted to these differentials and should not have to be readjusted to a new differential when such days recur, as they undoubtedly will. The matter should be considered carefully and an adjustment made, if necessary, when the biennial scale that is to come in effect on Apr. 1, 1918, is prepared.



DISTRICT TAKEN AFTER THE NEW SCALE WAS SETTLED IN NEW YORK CITY



**'Tis rightly called a "U" boat
For it puts it up to YOU**

God's Free Ocean Loan

\$7,000,000,000

Have you bought your Bond?

WIFTING

Editorials

The poster printed on the opposite page is most expressive and needs but little comment. Without the wholehearted support of each and every patriotic son, the government of these United States will be unable to accomplish the great purpose it has set out to perform. First and above all else comes money. The more we stand united in sacrifice now, the shorter will be our period of suffering and the sooner will all humanity be free. It is expected that these bonds will be issued in small denominations so that any person with a hundred dollars or even less can invest. Every coal company should immediately instruct its employees how and where to apply for a bond of this great "Liberty Loan."

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Race Between Wages and Living Cost

The Boston News Bureau says in a recent issue:

We cannot well swallow the camel of military conscription and afterward strain at the gnat of labor conscription, and there can be small justification for the steady increase of miners' wages at the price of diminished steamship traffic while the soldier continues to subsist on 30c. a day, dress on \$52 a year and find amusement on \$15 a month while the costs of food, clothing and amusement are doubled.

There is a good deal of truth in what is here expressed, but we cannot admit that the miner's increased wage was not justified, more justified than the larger increases in the price of coal that have taken place in the bituminous regions. The increased wage was needed to bring him into line with every other artisan, for all of these have been getting larger wages.

It is likely that it may not be possible during the war to raise wages per ton of product or per hour of labor enough to meet steadily the rising cost of living, because when we are wasting on war we cannot expect to have so much to spend on comforts and necessities unless we get it from steadier work and greater frugality. We have to remember that shells, guns, sunken ships and the lost time of battling men are as it were part of our rations.

But the mine worker must not be asked to draw his belt any more tightly than other workmen. He may have to be like all of us a conscript laborer in time—even now—but there is no reason why, when he is so compelled, that his burdens should be any greater than those of any other workman. We may shortly have to stop all increases in wages, but the increase that the mine worker has just received is by no means undeserved and only puts him in line with his fellows.

As for the soldier, he has been so sinned against in the past that the public hardly realizes that fact, and he is so patriotic and ready for the fray that he overlooks the discrimination practiced against him. It is to be hoped that we shall recognize his rights as Canada has generously done; in fact Congress has already done a little in that direction.

We are conscripting his labor; yes, we are conscripting his life, and we must pay him well as becomes a grateful people. He must not only be paid fairly well, but his dependents must be adequately cared for while he is at the

front. We must not wait for him to ask for this consideration; we must give it to him unasked as becomes good patriots and honest men. As for his food and his clothing, these are things which must be liberally provided no matter what they cost.

It is to be hoped that we shall not have to severely restrain the purchasing power of our people. We hope they will have just as much to spend, and that as good citizens they will put their earnings into bonds instead of into clothes, moving pictures and spirituous liquors. But to give everyone as good a living as if the war was not being waged, everyone must work every day and at real productive work.

To this end the railroads must be made so profitable by reasonably increased rates that they will be able to supply themselves with equipment. We must be careful lest by starving them they break down, as the state railroads



From N. Y. Globe.

AND SO ON THROUGH THE AGES

in Australia have done repeatedly, leaving wheat and other produce to rot on the ground for want of adequate transportation facilities. We must be careful lest the railroads from lack of encouragement or even open opposition fail to supply the needs of industry, and as a result make people idle at one end of the line and let people go without necessities at the other. Inadequate transportation has ruined Russia and Turkey. Are we going to have it cripple us also?

We will not need to worry so long as we are properly organized for work; but how can we double our output by steadier work and by introducing women into industry if we do not give our railroads a chance to measure up to the work of transporting the larger product? If we double output we must double transportation also. If we do not solve the transportation problem, the mines and the mills will be full of idle men and idle women, with a clamor rising higher and higher for the product they could produce, but which without transportation cannot be made available.



New York City's Fuel Bill Increases

The tightness of the coal market will probably result in New York City paying an extra million dollars for its fuel supply this year. Applications have already been made to the Board of Aldermen for special revenue bonds amounting to \$664,871.08, to pay the higher prices asked by the dealers; and with the situation becoming steadily more tense there is little doubt that nearly another half million dollars will be added to this amount.

The annual coal bill of the various city departments under ordinary conditions amounts to about \$1,500,000. Owing to the condition of the market last fall, and up to the present, most of the departments have already spent considerable of their yearly appropriation. One of these is the Department of Docks and Ferries, which was allowed \$245,020.90 for coal for 1917, but whose bill up to May 1 amounts to \$225,390.10. To meet the coal bills for the balance of the year an application has been made for \$316,492.40.

The prices paid by this department, since Jan. 1, have varied from \$5.79 to \$7.69 for buckwheat coal. Bids were opened on Apr. 23 for 86,900 tons of either buckwheat No. 1 or 2, the figures being \$8.90 for the larger size and from \$7.39 to \$7.97 for the smaller. In making the application for additional money to meet the bills for the remainder of the year, it was estimated that buckwheat coal could be bought at \$5.80 per ton and egg and stove at \$8.40.

Other departments that have asked for more money to pay coal bills include: Public Charities, \$180,000; Fire, \$22,865; Police, \$30,000; Bellevue and Allied Hospitals, \$56,700, and President, Borough of Brooklyn, \$30,000.

The opening of bids on Apr. 26 for 195,288 tons of coal for 14 of the departments resulted in the submission of what were probably the highest prices ever received by the city. Prices asked for furnishing the prepared sizes ranged from \$13.60 to \$14.75 per ton and for pea coal from \$11.70 to \$12.55 per ton, while those for buckwheat No. 3 ranged from \$4.95 to \$9.50 per ton. This contract was to be let for 11 months from May 1, and of the total requirements bids were received on 118,452 tons.

On May 26 of last year bids were opened by the Central Purchase Committee for 32,000 tons of hard and soft coal and the prices submitted ranged from \$6.50 to \$8.12 for stove coal; \$6.98 to \$7.50 for egg; \$3.83 to \$5.98 for pea; \$2.97 to \$4.75 for buckwheat No. 1; \$3.49 to \$3.68 for buckwheat No. 2; \$2.27 to \$3.52 for buckwheat No. 3 and \$3.27 to \$4.50 for mine-run. In the last proposal the prices asked on two lots of mine-run range from \$7.48 to \$9.35 per ton.

Earnings of the Coal Companies

Never before in the history of the coal industry have prices ruled at such extraordinary high levels as during the past six months. As a result, there is a great deal of interest as to how this is being reflected in the financial conditions of the coal companies. The annual reports for 1916 are now coming to hand, but they do not show the benefits of the improvements to the extent that might be expected. This is due largely to the fact that so much of the companies' production is covered by contracts they have not participated to a very large extent in the higher prices, and also to the fact that these did not become apparent until the last half of the year. However, it is gratifying to note that the financial statements of the companies show signs of improvement, though these will not be fully evident until the reports of the current year are available.

For the year ended June 30, the Lehigh and Wilkes-Barre Coal Co. showed increased earnings of from 16½ million dollars in 1915 to 18 million dollars in 1916, which is especially significant in view of the fact that the tonnage for the 1916 period showed a decline of nearly half a million. The gross revenues of the Lehigh Coal and Navigation Co., for 1916, were substantially the largest in the history of the company, amounting to more than 18½ million dollars, showing an increase of 2½ million dollars as compared with the preceding year.

Among the soft coal companies, the Consolidation Coal Co., for the year ended Dec. 31, 1916, showed an increase in its gross earnings of nearly two million dollars, its balance surplus increasing from slightly over one million dollars in 1915 to over 2½ million dollars in 1916. The gross earnings of the Pocahontas Consolidated Collieries Co. for 1916 showed an increase from slightly under two million dollars to nearly 2½ million dollars, the net earnings increasing from a million and a half dollars to two million dollars.

The big Pittsburgh Coal Co., in spite of the fact that its production declined nearly half a million tons, and also in spite of the heavy and relatively low-priced contracts it has with the Steel Corporation, showed a very substantial increase in its net profits from 2¼ million dollars in 1915 to over 3½ million dollars in 1916. Had it not been for labor difficulties, rail congestion, etc., which interfered notably with production, these figures would have been considerably larger.

Among companies of another type, as, for instance, the Consumers Company of Chicago, there were also substantially increased profits. This company, for instance, showed gross profits from sales in 1916 as \$3,897,944 compared to \$3,298,522 in 1915. The Central Coal and Coke Co., operating still farther to the west, showed an increase in net earnings from \$213,757 in 1915 to \$334,223 in 1916.

As evidence of what conditions prevailing over the first quarter of this year may bring forth, the earnings of the Pond Creek Coal Co. are of interest. For the quarter ended Mar. 31, of this year, this company showed profits of \$280,000, which compares with \$362,886 for the full year of 1916 and with \$104,016 for 1915. The extraordinary prices obtained for coal is also well shown in the report of this company, the average for the first quarter of this year being \$2.20 as compared with 93c. during the same period in 1916.

Notice

Appreciating the fact that American miners are patriotic, the following suggestions are made to avoid misunderstandings and unintentional wrong conduct. Acts and words permissible in peace times may be treasonable in war time.

To American Citizens—

- 1—Avoid arguments and discussions. They lead to disturbances and serious trouble.
- 2—Act considerately toward non-citizens and citizens of foreign birth.
- 3—Be on the alert to safeguard American interests by reporting to us at once any suspicious actions or words.
- 4—Avoid all waste of time and material. Wars are won by economy at home and in the shop as well as by soldiers in battle.
- 5—Guard carefully against fire. Report carelessness in the use of inflammable and dangerous materials, and the accumulation of waste matter. Keep fire buckets and barrels filled.
- 6—Wherever you can be of most value to our country is the place for you. A skilled foreman, miner, engineer, motorman, shotfirer or inspector, may serve his country best by helping to make what his country needs.

To Non-Citizens

You came to this country voluntarily and have made your living among us. Act during these times so that the citizens of America will welcome your countrymen in the future. Avoid any act or word that may arouse suspicion. Obey the law; talk English if possible, and don't argue.

An Nicht-Bürger!

Sie kamen in dieses Land freiwillig und erwerben Ihren Lebensunterhalt in unserer Mitte. Handeln Sie in diesen Zeiten derart, dass die Bürger Amerika's Ihre Heimatsgenossen in Zukunft willkommen heißen werden. Vermeiden Sie Handlungen oder Worte, welche Verdacht erwecken könnten. Unterwerfen Sie sich dem Gesetze, sprechen Sie wenn möglich nur englisch, und streiten Sie nicht.

A Nem-Polgárokhoz!

Önök kik önszántukból jöttek ebbe az országba és keresik meg kenyerüket mi közöttünk, viselkedjenek e napokban olyan módon, hogy Amerika polgárai, örömmel fogadják polgártársaikat a jövőben. Kerüljenek el bármilyen cselekedetet vagy oly szavak használatát, a melyek gyanút ébreszthetnek. Engedelmeskedjenek a törvényeknek, beszéljenek angolul ha csak lehetséges és kerüljenek minden vitát.

Signed.....

"COAL AGE" READERS MAY SECURE COPIES OF THE ABOVE NOTICE

Many mine owners and managers are desirous of advising their employees, both citizens and non-citizens, how they should conduct themselves under the present conditions. To this end "Coal Age" has prepared the notice which is reproduced on this page in small scale. The notice has been

printed in the form of a large poster suitable for hanging up on the bulletin board of a mine, and any number of these are available for mine operators or managers that care to have them. They are printed on heavy brown paper and will be supplied free of charge upon request to the Editor.

Department of Human Interest

Utah Fuel Co.'s Somerset Mines Prosper Under Prohibition

BY A. C. WATTS*

SYNOPSIS—The saloon at the mine of the Utah Fuel Co., Somerset, Colo., was turned into a clubhouse; and as a result of temperance the savings of the miners are increased, they work more steadily and they live on a higher plane.

A year ago on Jan. 1, Colorado joined the white-ribbon brigade. Knowing that the prohibition law would mean a revolution in the habits of many of its employees at Somerset, Gunnison County, Colorado, and feeling that some effort should be made to give the men a substitute for their saloon, the management of the Utah Fuel Co. did not wait for the law to go into effect, but served the

By the time the saloon management's lease expired all the material for remodeling the building was on hand, and work was immediately started to change the building into a clubhouse. The old front was torn down and the building was extended and a colonial front entrance built, the roof being changed at the same time to conform to the colonial style of architecture. On the river side of the building a two-story porch was built where the men and women can sit on summer afternoons and evenings and quietly enjoy the cool breezes. The old outside stairway is now used as a fire escape, and another escapeway was built on the other side of the building. Inside the structure, at all exits, electric signs indicate the escapeways. From the front vestibule of the building inside stairs lead to the upper story, and now the women and children can get up and down in safety and comfort.

The lower floor is used for the men's clubroom and has two pool tables and one billiard table, long reading tables, magazine and paper racks, card tables and comfortable



THIS BUILDING, ONCE A SALOON, IS NOW CONVERTED TO THE USE OF THE SOMERSET SOCIAL CLUB

saloon management with a legal notice to vacate the premises at the expiration of the lease, which was some three or four months before the new law was to become effective. Instructions were given the engineering department to make plans for remodeling the saloon building into a clubhouse.

The old building was an ugly two-story frame affair painted white, with the usual flaring store front of western towns with which we are all familiar. The lower floor had been used for the dispensing of drinks, etc., and the upper story for the amusement hall of the town. A flight of steep, covered stairs led from outside the rear of the building to the upper story. It was altogether an extremely unattractive place. The building was situated at the lowest end of the town and was the first object that attracted one's attention when looking from the train, or driving up the cañon approaching the town.

*Chief engineer, Utah Fuel Co., Judge Building, Salt Lake City, Utah.

chairs. The second floor is devoted entirely to moving pictures and social gatherings.

The building was repainted a cream color with yellow trim and red roof, and the transformation is complete and surprising to one accustomed to the old order of things. Now, instead of the straggling line of men wandering down to waste their earnings and unfit themselves for work, can be seen a well-dressed stream of men, women and children going to pass many a happy hour in innocent amusement or useful instruction.

The company has turned over the building to its employees and their families and furnishes rent, heat and light free. The Somerset Social Club was formed by the men of the town and has the entire charge of the building. Article 2 of its constitution states: "The object of this club is to furnish and equip a suitable clubhouse, to advance mutual improvement by debate and composition, to aid in the diffusion of knowledge among its members and the cultivation of social qualities and physical training."



SOMEWHAT STARTLING GARAGE FOR A MINING TOWN

In carrying out the purposes as stated in its constitution the club subscribes for about 20 weekly and monthly magazines and 10 daily papers. It has a Columbia Grafonola with a large number of records to suit the various nationalities of the men represented in the membership. It supports a band of sixteen pieces which gives one free public concert a week during the summer months, and a baseball team which makes the managers of semi-professional teams throughout the district do some "tall scratching" to beat. Membership in the club entitles the owner and his family to free admission to two ball games per month.

A janitor is hired by the club so that the work of keeping the building clean and orderly is not left to voluntary help, which is generally as inefficient as it is inexpensive. A small writing room is maintained and equipped with club stationery, etc. As a result no doubt many a letter is sent to home folks that otherwise would never have been written. By having so much literature available the foreigners are learning to read English.

PROHIBITION HAS DONE WONDERS FOR SOMERSET

Now as to the results of this substitute for the saloon, it is easily noticeable that men who were formerly addicted to drinking and gambling and were habitually in debt are now either out of debt or getting out very fast. They are happier; they attend to their work better and are better dressed. Their families are also better dressed and live better. Pay day now no longer has any effect on the number of men who report for work the next day. It can occur in midweek, but the average number of men at work the following day will be unchanged.

Nor have holidays such as Christmas and New Year's Day any of the evil effects so noticeable in the old saloon days. Of course, as a result of this steady operation the average earnings of the men are higher than they formerly were, and the bankers in the town below say that during the fourteen months of prohibition the savings deposits have been the largest in their history. The merchants also are unanimous in saying that bills are paid more promptly, and people have more money to spend. Fourteen automobiles are owned in the camp, and this in face of the fact that there are only two ways to travel, both beset with difficulties, one up cañon, and one down cañon.

Several men own farms nearby on which they work in the summer, returning to their places in the mine during the winter months.

Other features of sociological work are the Boy Scouts and Camp Fire Girls organizations. Believe me! they can both start something when they try. Then again, there are the night schools for foreigners meeting twice a week with an average attendance of 25. The mine-rescue and first-aid men are enthusiastic and thorough in their work. In 1915 the first-aid team won the Colorado Western Slope Championship Cup.

At the time at which the club was built the company erected close to the mine the first section of a miners' bathhouse. This was the first attempt our company had made along this line, and it was only large enough to accommodate 75 men. While not the finest in the land, it is sanitary and certainly provides means for removing the mine dirt. This year we will build an addition capable of taking care of 75 more men.

It is our experience that there is possibly no other facility that does more good than a bathhouse. Men now say they would not work in a place where this convenience was not provided. I don't know what the women say, but any one who knows what it means to a woman to carry water, heat it and clean up after the man has shed his pit clothes and accompanying dirt can well understand what a relief it must be to the women.

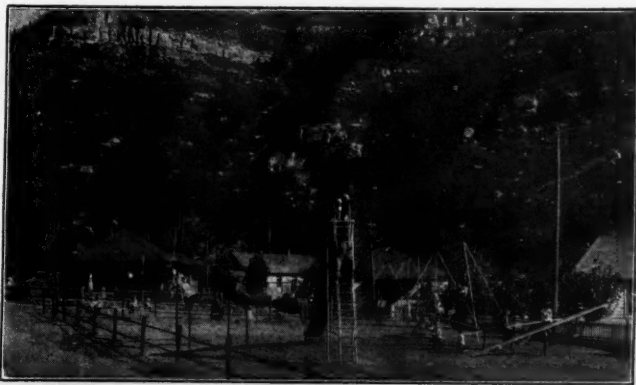
FOREIGNERS ARE NOT LEAVING FOR "WET" STATES

Our conditions at Somerset are so different from the environments of coal-mining communities in eastern and foreign countries that these things mean much more to the men and their families. Somerset is at the end of a branch railroad in a narrow cañon. The nearest town is seven miles away from any other town, and even that has only 1000 inhabitants. The train comes in about 6:30 p.m. and leaves at 8:15 the next morning. The miner and his family cannot run up to town in an evening, nor spend a half holiday at some resort.

All his pleasures must be made by himself at home, and his surroundings tend to intensify this condition, for he can only see about a mile up and down the cañon. But I don't know of a happier and more sociable community. The population is 40 per cent. American; 29 per cent. Austrian; 14 per cent. Italian; 9 per cent. Finn; 2 per cent. German; 2 per cent. French; 2 per cent. Swedish; 2 per cent. Mexican. Talk about "melting pots"—here is one. Once here the men stay, and floaters are unknown.

You should see the flower and vegetable gardens in summer. The soil is fertile, for the town is situated on a river bank similar to a river delta. Most of the soil is a fertile silt from disintegrated lava rocks. Pictures cannot do these gardens justice, but many families raise all the vegetables and greens they can eat and have enough to last through the winter. Lawns here mean much to our people, for constant familiarity with the wild and "impressionistic art" of the mountains, makes the placid beauty of the green sward a pleasing contrast. They are the oases of the desert and are carefully cherished.

The back yards of the villagers are not suited to the growth of mountain flowers with their delicate beauty,



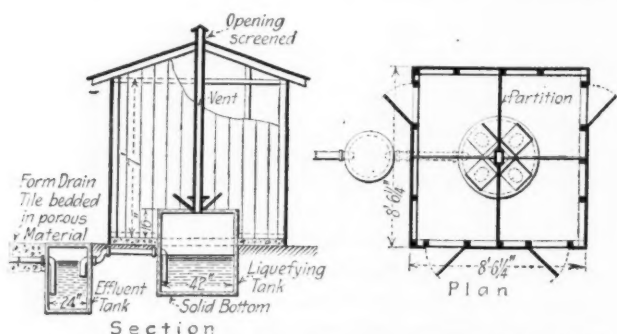
WHERE THE KIDDIES HAVE THE TIME OF THEIR LIVES

but wonderful collections of the familiar home flowers more than prevent that want from being felt. A few years ago, two or three of the leading officials "dug down" into their pockets and purchased shade trees, which they gave to any one who would plant and care for them. They also hauled earth, furnished fertilizer, fence posts, etc., so that now almost all the houses are fenced in and have lawns, shade trees and gardens. Somerset is as nice a coal-mining town as can be found in the West.

Sanitation in Mine Villages

Mine managers realize fully the crudity of conditions around mining villages and know that the menace to the health of the mine workers arises more from nuisances outside the mine than from the insanitariness of the mine workings. There is a desire to provide facilities such as are enjoyed in towns of greater population, but the problem arises, How to remove sewage without rendering foul the small streams on which mining towns are located? Only occasionally are mining villages placed near rivers and creeks which could receive the fecal matter without marked offense to riparian owners. But the question of sewerage has usually come at such a late date that regulations and court rulings make it hard to install sewers without some manner of septic tank, even when there is a river handy to take care of the effluent.

The first illustration shows a system for a central privy with four separate units discharging into a liquefying tank. The material falls below the surface of the water and beneath a scum which soon forms and floats on the top. It has been ascertained that the harmless anaërobic bacteria thrive under these conditions. They prosper wherever air and light are excluded, and such a habitat is found in these tanks, for the oxygen in the water is continuously removed and the light is excluded by the scum



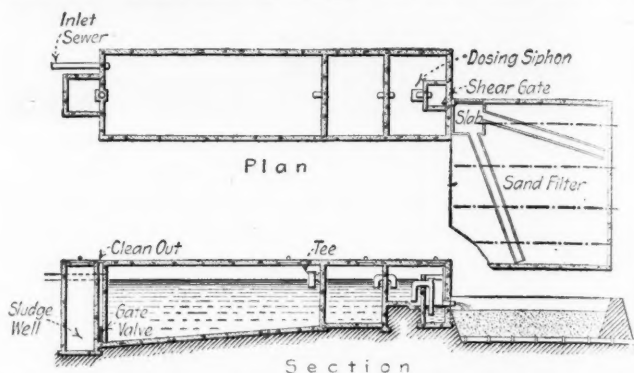
A SEWAGE PLANT FOR FOUR SANITARY UNITS

on the water. Under the beneficent influence of these bacteria the sewage, including its paper content, is changed in character and becomes liquid and progressively sterile as far as the harmful aerobic bacteria are concerned. The fluid is kept to a given level by a curved pipe which delivers it to an effluent tank where the action is continued. The level of this tank is kept constant; whenever an excess of fluid accumulates some of it is removed from the bottom of the effluent tank and passes by a loose drain tile into porous material. These tanks only require a little water about once every week. They need no chemicals or scavenger work. They do not generate flies, mosquitoes or offensive odors.

This equipment is based closely on what is known as the L. R. S. system devised by Lumden, Roberts and

Stiles of the United States Public Health Service which has been in satisfactory operation for several years.

The second illustration shows a more elaborate installation for a whole mining village. In this there is a clean-



SEWAGE PURIFICATION PLANT FOR MINE VILLAGE

out gate, sludge pit, liquefying tank, effluent tank, dosing pit and sand filter. Septic tanks of this and similar types are made by the Cement Products Co., of Wilmington, N. C. They are termed by them the Sanisep Septic Tanks.

These Men Have Done Their Bit

By P. L. MATHEWS*

There's heaps of men with shell-torn limbs
And men with shattered nerves,
And men who'll never see again
(And men we'll never see again),
Who answered War's demand for men;
Real men—no weakling serves.

Whatever way you look at it
I claim these men have done their bit.

There's many men behind the front
Who do their part as well.
They never kick for overtime,
They work in mud and blood and grime
And less than all's a slacker's crime;
Their deeds we oft hear tell.

Whatever way you look at it
I claim these men have done their bit.

When autocrats desire to rule
The whole blamed universe,
And seek to bully Uncle Sam
And down his throat their will to ram
Their friendship just an overt sham;
This point is plain and terse:

Whatever way you look at it
I claim it's time to do our bit.

The mining man may never wear
The medals on his chest;
But just the same if he can grow
Two tons of coal from down below
Where one ton only used to grow
And does his level best—

Whatever way you look at it
I claim that constitutes his bit.

*Santo Tomas Coal Co., Santo Tomas, Tex.

Discussion by Readers

Water Gage in Fan Ventilation

Letter No. 1—Though always an interested reader of *Coal Age*, I have never availed myself of the privilege of taking part in the discussions that appear in its columns. However, the experience described in the inquiry of Samuel Dean, Apr. 21, p. 722, has attracted my attention, being interesting as well as practical and illustrating a principle that cannot be expressed too strongly to every mine operator.

Mr. Dean's statement that the bratticing off of the main return airway of a mine ventilated by a fan shows no increase in the water-gage reading, for the same speed of the fan, agrees fully with my own ideas of fan ventilation. I would say that there was "some hidden cause" in the several fan tests mentioned in the reply to this inquiry, rather than in the test made by Mr. Dean, and that was responsible for the increase of water gage in the first-mentioned tests.

My belief is that a modern fan ventilating a mine will produce a little higher instead of a lower pressure when circulating air through the mine than when there is no air passing by reason of its passage being blocked. The increase, however, is very slight and often escapes notice.

Briefly explained, my theory is that a fan running at a constant speed produces a constant depression, represented by the water-gage reading in the fan drift, plus the pressure absorbed in passing the air through the fan.

THE NORMAL CAPACITY OF A FAN

To illustrate, let me suppose a fan of given dimensions to be running at a certain speed and producing, say 3 in. of water gage in the fan drift. Now, if we close off the fan drift leading to the mine any increase of water gage will show that the intake and discharge areas are too small for the dimensions of the fan wheel and housing.

I would describe this condition by saying that the fan is working above its normal capacity and is therefore mechanically inefficient. In my opinion, when the intake and discharge areas of a fan are properly proportioned to its other dimensions, or when a fan is not working above its normal capacity, the same speed of fan will produce the same water-gage reading in the fan drift whether or not air is passing.

Again, if the air current is short-circuited when the fan is working up to its normal capacity, so that the circulation does not pass through the mine but is discharged from the fan drift into the atmosphere, a larger volume of air will pass through the fan and, as a result, a greater portion of the depression due to the fan's action will be absorbed within itself. The reading of the water gage will then be lower than when the air current is circulating through the mine, the speed of the fan being the same in each case. Notice, however, that if the fan is not running up to its normal capacity when the air is short-circuited no appreciable effect will be ob-

served in the reading of the water gage, until enough air is short-circuited to bring the fan up to its normal capacity.

Many thousands of dollars are wasted annually in the ventilation of mines by operating fans at less than normal capacity, such fans not being proportioned to the duty they are expected to perform.

My conclusion is that when a fan is working at less than its normal capacity, any obstruction in the airways of the mine will not increase the water-gage reading of the fan drift. On the other hand, if the fan is working above its normal capacity, any obstruction of the air courses in the mine will reduce the circulation through the mine and through the fan and increase the water-gage reading in the fan drift.

Again, if the air current is short-circuited when the fan is operating at normal capacity there will result a drop in the water-gage reading; but if the fan is working at less than its normal capacity no appreciable effect will be observed in the water-gage reading when the air is short-circuited.

W. J. MONTGOMERY,
Columbus, Ohio. Jeffrey Manufacturing Co.

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Mine Discipline

Letter No. 3—If we are, as men have been taught to believe, "our brother's keeper," the safety of every man in the mine should be our concern. The careless act on the part of anyone, regardless of the position he holds, whether trapperboy or mine official, should arrest our attention, and we should do what is possible to prevent its repetition.

True mine discipline requires that every worker underground should report his observations of carelessness or violation of the mine rules and regulations, on the first opportunity, to the official in charge. It matters little how trivial the act may be, it should be reported and proper means taken to prevent the mistake being made again.

The slogan "Safety First" is a good one, but I feel that it does not sufficiently emphasize the matter of the individual responsibility of mine workers, in the way of preventing accidents. What is needed badly is some means of impressing on all mine workers the necessity for the exercise of greater care. This can only be done, in my opinion, by the adoption of a system of fines.

Where men are so scattered as they are in mining work, it is difficult to compel obedience to rules and regulations, and a system is needed that will be effective throughout the mine. To this end, let the management formulate a code of safety rules, with penalties attached for each violation, and let this be submitted to the men and their acceptance urged. The coöperation of every worker is necessary to produce good results.

I believe such a scheme would prove efficient, as each man would then be informed in regard to what is required and would know that any act of disobedience or

violation of the rules, on his part, would be reported by those who were more anxious than he for the safety of the mine and the men working therein.

It would be well to post all fines imposed, semimonthly, giving the name of the person, his act, occupation and the amount of the fine. The cash collected through such a system of fines should be devoted to some charitable purpose, such as the care of injured mine employees, family sickness, or other like cause.

West Leisenring, Penn.

R. W. LIGHTBURN.

Repair Supplies Reduce Cost

Letter No. 2—A short time ago I read a letter on this subject, *Coal Age*, Vol. 10, p. 1056, which called to mind an incident in my own experience that illustrates clearly the need of keeping necessary supplies in stock. Managers and superintendents will scheme, in every way possible, to reduce the cost of operation and yet ignore the question of keeping on hand a supply of repair parts for the machines they are operating, forgetting that such practice would avoid many costly delays.

In the instance I will cite, a machine-runner informed the machineboss that the commutator on his machine was nearly worn through. The boss examined the machine and found that a new commutator would be needed in a short time. Not having the authority to order supplies directly, he signed a requisition and sent it to the general manager, asking for a new commutator for the machine.

A SHORTSIGHTED POLICY AND ITS EFFECT

The policy in the manager's office was not to order any supplies until they were actually needed. It was not thought that there was any immediate necessity to place this order for a commutator, as the machine was still running. The order was therefore sidetracked and five or six weeks later the commutator on the machine gave out.

As this was one of the most important of the four machines in use in the mine, the machineboss at once called up the general manager's office on the phone and stated the case, explaining that the machine was out of commission and could not be used until the new commutator arrived. This caused an immediate investigation, and a rush order was sent forward for the new parts to be sent by express without delay.

At this time, the price of coal was going up rapidly and soon reached the \$3 mark at the mine. As the output was reduced about one-third, by reason of the big machine being out of commission, the general manager was angered at the delay. When the commutator arrived, however, a new disappointment was in store, for it was found that it was not the size required for this machine and had to be returned and another one ordered in its place, which came by express a few days later.

In their haste to put the machine in operation as quickly as possible, they overlooked the fact, which a closer examination would have revealed—namely, that the insulation on the armature coils was badly charred by reason of long use. Not to cause any further delay, however, they patched up the armature and started the machine, which ran about a week, when the armature burned out, and the machine was again idle.

The report of this condition brought the general manager to the mine in a hurry. On his departure, the superintendent overhauled the machineboss and machine-

runner, whom he found below ground at work on the machine. The superintendent accused the machine-runner of burning out the armature on purpose. This led to a heated argument, and language was used that would have caused the superintendent to dismiss the runner, had not the machineboss defended him.

It goes without saying that all this unpleasantness, loss of time and increased cost would have been avoided had the necessary supplies been kept in stock, or the order made for a new commutator when the requisition was first sent to the office. The expense incurred by the delay would have almost paid for a new machine.

Two of the machines used in this mine are of the same make and type, but were purchased about two years apart and, as a result, the armature in one of the machines is slightly larger than that in the other. Much future trouble would have been saved if, when the second machine was ordered, the size of the armature of the one in use had been specified as desired in the new machine. This would have necessitated keeping but one armature in stock, which would have fitted either machine.

Wellsburg, W. Va.

DANIEL F. SMITH.

Construction of Mine Overcasts

Letter No. 2—Referring to the inquiry of Henry Groos, *Coal Age*, Jan. 27, p. 204, kindly allow me to submit two forms of overcasts that have proved very serviceable and economical in my own experience. In the building of mine overcasts, it is important to consider not only the conditions relating to the support of the overlying strata and the sectional areas of the haulage road and airway, but the length of time the structure must last, as these facts will determine what is needed.

The first of these two forms of overcast, or air-bridge, is the more permanent one, designed to last for many



FIG. 1. PERMANENT OVERCAST



FIG. 2. TEMPORARY OVERCAST

years. As shown in Fig. 1, it consists of two brick walls built on either side of the haulage road and supporting the floor of the overcast, while the roof above the airway is supported by crossbeams and lagging held in place by two timber frames resting on the walls below.

The work of excavation for this overcast was done by contract. The roof was to be blown down to a height of 12 ft. above the rails for a distance of 18 ft. crosswise of the haulage road and 6 ft. wide at the top. It was arranged that the last two or three shots, on each side of the haulage road, were to be left, and this material was to form a backing for the sidewalls that were built later, as indicated in the figure.

When the contract work was finished, a 9-in. wall 5½ ft. high was built on each side of the haulage road and set back 1 ft. in the rib. A manhole was left in the wall on one side of the road and closed by a door, which was kept locked by the mine foreman. Two-inch planks were then laid on top of the walls to form a suitable bedding for the beams supporting the floor of the overcast.

The floor consisted of two layers of planking laid so as to break joints, the cracks being sealed with wood pulp to prevent the leakage of air. Posts or timber frames were set on top of the sidewalls, and two iron rails thrown across the collar beams supported the lagging protecting the roof of the airway.

A cheaper form of overcast, designed to last but a short time, is shown in Fig. 2. Here the roof was shot down to a height of 10 ft. above the rail, the refuse formed by the last shot being left as backing for the brattices on either side of the roadway.

As shown in the figure, timber frames were stood in the roadway to form a square set, and above this the floor of the air-bridge was laid. Lighter timber frames were set in the airway above and the roof supported with lagging as before. The rib on each side of the roadway was lined by brattice boards placed back of the timber frames, and all cracks were made air-tight.

Clinton, Ind.

TIM GOLDON.

Preventing Mine Accidents

Letter No. 1—Having been an interested reader of the letters recording mine accidents, I am impressed with the idea that the publication of these accidents, as well as the display of many "Safety-First" signs, in and about mines, and the showing of stereopticon views of "How Accidents Occur" are not effective means of preventing accidents. It would seem that the more miners are warned and the more they read of accidents and look on pictures showing how they occur, the less heed they give to avoid such occurrences.

Observation leads me to conclude that the reduction of the accident list in mining will depend less on warnings given by the means mentioned than on the seriousness with which the mine worker considers an accident. When a miner is present and sees a fellow worker hurt, maimed or killed, it makes him more careful for a few days, but the effect passes off shortly and he is then as careless and reckless as before.

After attending a stereopticon entertainment designed to show how accidents happen in mines, I knew a miner to be killed the following day in a manner regarding which he had been warned but a few hours before. At the fatal moment a miner is generally thinking more of what he is doing than of how it should be done.

RIGID DISCIPLINE THE REMEDY FOR ACCIDENTS

As is often remarked, more miners are killed by falls of roof and coal than from any other cause, and yet a miner told to timber his place will invariably reply by telling how long he has mined coal without accident. The remedy, therefore, would seem to lie in a rigid discipline, such that when a man is told to stay out of a place, he will stay out until it is made safe for work—when told to set a post or take down a loose piece of slate he will do so at once and not wait until his car is loaded.

When a foreman gives instructions to a miner in regard to making his place safe, it is important that he should remain and see that the work is done. Every miner should have the tools necessary to do the work safely, and if these are not on hand the man should be made to leave his place until they can be procured.

Many miners follow the old practice of sounding the roof of their place by striking it with a pick. This is a

poor method, as it furnishes little information in regard to how loose the top may be at the time. When striking the roof with a pick, the miner should hold his other hand against the slate, and if the piece is loose, he will generally feel the vibration caused by the blow. The sound produced is not always a good index of the safety of roof in a heading or room. A loose rock will often sound as if it were solid formation when, in fact, it is loose and ready to slip from its place.

There seems to be a disposition on the part of many experienced miners to ignore danger or be forgetful of its presence, and the closest supervision is required for their protection. A man's experience is sometimes the pitfall that may cost him his life. It does not tend to make a man cautious but rather gives him the feeling that he knows when danger is near. The only safe rule is constant watch and thoughtfulness on the part of the worker, and thorough supervision of miners by company officials.

The annual report of the Department of Mines of this state shows that, for the year ending June 30, 1915, 424 lives were lost inside the mines, which meant one fatal accident for each 151,223 tons of coal mined. These lives were all lost in 236 mines, whose total tonnage was but little more than one-half of the coal production for the entire state. This can only be explained by the lack of regard for safety in the operation of those mines.

I have in mind one company that has mined 1,000,000 tons of coal with but a single fatal accident. It is significant that this company employs from two to six assistant foremen in each of its mines. Too often it is the case that mine officials are more interested in the production of coal than in the safety of their men and the security of the mine, and in order to make a good showing on the cost-sheet, timber and other supplies are not furnished the miners as needed.

D. H. PERDUE.

Bluefield, W. Va.

Practices in Blasting Coal

Letter No. 2—I was glad to read the letter of George A. Brown, *Coal Age*, Apr. 7, p. 638. It is a timely warning to many miners, especially now when the raise granted them of 10c. a ton on all coal mined will act as an incentive that will lead many to adopt unsafe measures in order to get out more coal.

Like Mr. Brown, I have held the positions of fireboss and shotfirer and found that miners, with few exceptions, will not obey the usual mine-safety regulations, unless they are closely watched. As a class, miners will take every possible advantage of a shotfirer. My experience has taught me that, while miners are a reckless lot, they will not fire a shot themselves that they seldom hesitate to fix for a shotfirer to light. They would say that the shotfirer is paid for taking the chance, and they do not fail to give him the opportunity of earning his money.

The only safe plan to pursue is that the shotfirer examine each hole before it is charged; and it is better that he should charge, tamp and fire all shots himself. While this is done in some mines, in others the miners are expected to charge their own holes. In such cases there is little to show whether or not a shot is safe to fire.

Even if the shotfirer knows the depth of the hole, he does not know the amount of powder or kind of tamping used and, in many cases, he can only roughly guess

if the length of fuse is sufficient to enable him to reach a place of safety before the charge explodes. No hole should be fired with less than 4 ft. of fuse.

Miners resort to many different schemes to elude the vigilance of the shotfirer. One bad practice is to place a small piece of dynamite in the back of the hole with the view of assisting the cutting for the next shot.

When making up a cartridge a miner will sometimes place a little powder in the bottom of the cartridge and then put in the dynamite and cover it over with more powder, which practically makes a dynamite cartridge. In like manner what is supposed to be a clay dummy will often contain powder or coal dust.

If a miner's cartridge sticks in the hole and he cannot push it home, rather than lose the shot he will often fill up the hole with a dummy, using but a short piece of fuse so as to make it appear that the shot is all right. The shotfirer has no means of telling that there is anything wrong. This happened in a mine where I was employed some time since. The shotfirer had gone but a few feet, after lighting the fuse, when the shot exploded and he was blown down with great force, his face and hands being badly burned and his eyes filled with coal dust. The miner, however, escaped the extra work of drilling out the powder the next day.

INFLUENCE OF MINERS' UNION

In another mine where I was employed as fireboss there were two shotfirers—one employed and paid by the company, the other by the miners' union. One night, as I was making my rounds, the union man asked me to look at a shot that he had refused to fire. I did this, and saw at a glance that the shot was unsafe, and so informed the shotfirer.

The miner who prepared and charged the hole was a loud, boisterous talker. He reported the matter to the union, in which he was a power by virtue of his loud talk. He was supported in his contention against the shotfirer, and the latter was discharged and a man employed who would fire any shots the men prepared.

It was not long before things assumed serious shape in the mine, owing to many windy shots that blew down doors and brattices and knocked out timbers. Things were in such bad shape that, a little later, I called the mine inspector's attention to the matter. As a result, the inspector reached the mine one night, unexpectedly, just as the shotfirer was ready to start work. He made the rounds with the shotfirer, and out of 76 shots prepared by the miners 18 were found to be unsafe to fire.

The mine inspector informed the shotfirer that he and the miners who prepared the shots would be responsible for any damage done in the mine or any lives lost. He added that in case of accident he would prosecute the ones who were to blame. This had the desired effect for a while, but I understand that shortly after I left the mine the trouble was almost as bad again. I would not be surprised, at any time, to learn of an explosion taking place in that mine, and it would certainly be a disastrous one, owing to the large amount of dust in the workings.

No part of mining should be given more careful study and nothing requires the exercise of more judgment than the blasting of coal or rock; and yet little attention is given to the matter in most mines. Foreign miners are more apt to put too much powder in a hole than too

little. They know that they are expected to load a big turn of coal, and they do not realize the danger of using too heavy a charge of powder. Their main idea is to get down the most coal in the easiest manner possible.

Herrin, Ill.

OSTEL BULLOCK.

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Powder Ignited by Spark

Letter No. 2—Following the brief account given on page 545 of the issue of Apr. 7, citing an accident caused by a miner attempting to drive a charge back into the hole in which it had become wedged, using for that purpose a copper-tipped tamping bar with which he persisted in pounding the charge, *Coal Age* asks for the ideas of its readers as to how the powder became ignited. The suggestion is offered, in the same article, that "a small piece of sulphur must have been knocked loose in the hole" and struck fire in the pounding of the charge.

Permit me to suggest a possible cause of the ignition that appeals to me as more probable than the one suggested. Two conditions are always necessary before ignition can take place—the presence of a combustible and a sufficient temperature to make it ignite. In this case the powder was the combustible and, in my opinion, the necessary temperature may have been caused by the compression of the air in the bottom of the hole, back of the charge, when the latter was being pounded.

It will be remembered that the ignition of a combustible, by the compression of air, has been demonstrated by a simple experiment that was performed by Joseph Dickinson, Inspector of Mines, Great Britain. In that case some tinder was placed at the bottom of a small cylinder having a tightly fitting piston. By quickly forcing the piston downward, the air in the cylinder was compressed, producing a spark that ignited the tinder ("*Mine Gas and Explosions*," Beard, p. 172).

Doctor Bedson has shown that fine coal dust ignites at a temperature of 284 F., and it is well to remember this fact in the tamping of holes that are liable to contain fine dust, as this temperature would be easily attained in the compression of air.

The Alberta Mines Act, Sec. 65 (4) reads, "No explosive shall be forcibly pressed into a hole of insufficient size." All danger from this cause would be eliminated if this provision of the Alberta law was carried out in all mines.

M. CRANSTON.

Pocahontas, Alta., Canada.

[It must be remembered that the heat of compression of air in a shothole, if this was possible to take place, would be rapidly conducted away and lost in the strata and, therefore, the temperature produced would not be sufficient to cause ignition of dust or powder.—Editor.]

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Working 3-Ft. Pitching Coal

Letter No. 11—There are reasons for using cars having a capacity of, say 1 ton, in the working of thin pitching coal. Also, there are reasons for using such a machine as the Ingersoll-Rand "radialaxe" machine for mining this coal, and I will refer briefly to these two points.

In the first place, a trip of about 25 cars is practically all that a mine locomotive can handle to advantage. In order to save time and maintain a good output, it is of importance to haul at least 25 tons of coal to the tippie

in a single trip. To reduce the capacity of mine cars to, say $\frac{1}{2}$ ton, would require the handling of a very long trip, which would be a great inconvenience in the mine and on the tippie, or reducing the tonnage hauled by one-half and limiting the output of the mine about in the same proportion.

Referring now to the mining of thin coal in a pitching seam by the use of machines, few will deny that the radial coal-cutter possesses particular advantages over other types of machines working under these conditions. It is particularly useful in entry work, where a single setting of the machine will serve to undermine the entire face of the coal.

Not the least of the advantages of this type of machine, however, is the fact that it can be used for cutting out bone or clay bands in any portion of the seam, as well as shearing the coal or making a rib cut.

Owing to its lightness and compactness, it is particularly adapted to the mining of pitching coal. For the same reason, it is easily dismounted and taken through the crosscut into an adjoining room, where it can be set up and started to work within 20 min. This is a great saving of time and expense when compared with other types of coal-cutters that must be moved on a truck out of one room and into another.

In one instance that I recall, there is a seam of bone 2 in. thick near the top of the coal, and this machine is used to remove this 2-in. parting, which has always proved a hindrance in the sale of the coal.

Crawford, Tenn.

W. T. HALE.

[This closes the discussion "Working 3-Ft. Pitching Coal."—Editor.]

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Timbering After Machines

Letter No. 7—I had not expected to add anything to the letters that have appeared criticizing the method of wedging a crossbar set over a single post, for the support of a drawslate, when undercutting the coal with machines, as suggested by John H. Wiley, in his inquiry, *Coal Age*, Vol. 10, p. 941. My experience of 30 years, however, in the work of timbering and supervising timbermen, compels me to side with the orders given for the discontinuance of the cantilever system mentioned by Mr. Wiley.

The usual company regulations require the setting of a center post in the 12-ft. place, but it does not appear from the method described by Mr. Wiley that there is any provision made for this center post. The method of timbering employed in machine work at No. 2 mine, Leisenring, and in other places with which I am familiar, makes the place as reasonably safe as can be expected.

In that method a center post is set as soon as sufficient coal has been loaded to permit this to be done. This post supports one end of a cap-piece made by splitting an 8-ft. post in half. The other end of the split post rests on the last crossbar nearest the face and serves as part of the lagging when the timberman sets the next crossbar. Sometimes there is room to set two crossbars before the coal is again mined either by pick or machine.

Timbering always requires good, steady men who are tall enough to reach well up in the roof and do the work properly. They should be from 28 to 40 years of age and physically strong.

While not wishing to appear to unduly criticize an honest opinion, I feel that where crossbar timbering is needed both legs should be set at once. If one of the posts is knocked out by the falling coal, or by a shot, the bar may still be held by the other leg, and the fallen post can be reset by the timberman at the first opportunity.

Because, as Mr. Wiley says, no accident has happened thus far, does not prove that an accident will not occur by the use of his method. I have offered these few remarks in all sincerity, believing that good fortune may seldom rap more than once at our door, and we should take warning in due time.

TIMBERMAN.

West Leisenring, Penn.

[This letter will close the discussion "Timbering after Machines."—Editor.]

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Service That is Appreciated

Letter No. 3—I have often thought that strikes in coal mines would be far less frequent if the honest, hard-working miner, who has spent the best part of his life in the mines working for a single company, were to be suitably rewarded for his faithfulness.

The working conditions in the life of a miner are not always encouraging and, while large coal companies frequently do much to improve the health, safety and comfort of their employees, there are many instances where the honest toiler receives little or no recognition to indicate that his work is appreciated.

Take, for example, an experienced miner who has dug coal for a number of years at the working face, besides doing all kinds of daywork required in the mine. This man should have the qualities that make a good foreman if he has been given the proper training as opportunity has arisen from time to time. His experience should render him capable of handling men to the best advantage and seeing that work is properly performed.

My thought is that men should be treated by the company, which they have served for a long time, with the same consideration and faithfulness as they have manifested in the performance of their work. Many a good miner is ambitious and anxious to succeed, but has not been given the opportunity to show what he is worth.

Instead of this, it has too often happened that the faithful one is ignored and must stand aside and see a man of less experience and shorter term of service given preference in promotion. He is often blamed for neglect that was not wholly his own. A slight mistake on his part is frequently magnified in importance, and he seldom receives the same consideration as a foreman who, perhaps, makes greater mistakes and more of them.

An instance occurred some time since, in my own experience, that bears out the truth of this statement. For a slight mistake with which I was accused, but the nature of which was not made known to me, I was dismissed from the company, after having served in all kinds of work in the mine for a long period of time.

It is because of these occurrences that miners are willing to form unions for their own protection, to hold what they have and secure rights that are theirs. Every miner of ability who is sober and industrious should be encouraged and his service recognized in a tangible way.

Johnstown, Penn.

MINER.

Inquiries of General Interest

Reinforced-Concrete Shaft Lining

Can you give me a simple formula for calculating the required thickness of a reinforced-concrete lining for a shaft? What formula would be used for different forms or cross-sections—circular, elliptical and rectangular shafts?

G. L. Cox, Chief Engineer.

Huntington, W. Va.

Solvay Collieries Co.

It would be impracticable, even if possible, to give a formula that would serve to calculate the thickness of reinforced-concrete shaft lining, expressed in terms of the dimensions of the shaft and depth below the surface, because there are too many variable factors and uncertainties involved in such a determination.

In the first place, the possible pressure that may be exerted on a shaft lining cannot be estimated in terms of "head" or depth below the surface. This pressure will depend more on the character of the strata with respect to the degree to which they are self-supporting and the presence of faults or slips and water in the strata, together with their inclination. These factors cannot be computed, but must be considered on a basis of practical experience in each case. It is possible, only, to offer a few general facts and suggestions in this connection, and leave the engineer in charge to study the conditions that confront him and adopt such means as appear best suited to meet his needs.

The resisting power, or strength of concrete, will vary greatly with the proportion of cement, sand and stone used and the quality of these ingredients, the age of the mixture and manner of its preparation. Constant and thorough inspection of the process of mixing concrete is important, in order to insure a uniform strength in the completed structure. The safe compressive strength of concrete will vary from, say 300 to 750 lb. per sq.in. A fair average compressive strength, for a 1:2:5 concrete, after one month, may be taken as 500 lb. per sq.in., assuming good portland cement, sharp clean sand and broken granite passing through 1½-in. mesh are used.

In the reinforcement of concrete with steel rods, bars or rails, it is usually of interest to the engineer to be able to determine the relative sectional areas of steel and concrete that should be used to withstand a given pressure, in a beam or member of given form. The customary practice is to make the area ratio of steel to concrete approximately equal to the inverse ratio of their moduli of elasticity. The modulus of elasticity of steel may be assumed, for this purpose, as 30,000,000, while a fair average for the modulus of elasticity of good concrete can be taken as 2,000,000. This makes the area ratio of steel to concrete 1:15. Under different conditions, this ratio will vary from, say 1:10 to 1:20, depending on the stability of the structure, its importance and the strength of the concrete mixture.

In designing reinforced-concrete structures, it is important to consider carefully the character of the stresses

set up in the member and the relative resisting power of the steel and concrete of which it is composed. For example, a member supporting or resisting a transverse load or pressure is subject to both compression and tension in its fibers—the fibers on one side of the neutral axis being compressed, while those on the other side of that axis are extended.

Experimental tests have shown that the tensile strength of concrete will seldom exceed one-tenth of its compressive strength. For this reason, it is important to reinforce a concrete member with steel rods or bars in that portion of the member subject to extension, so as to make the resistance to extension approximately equal to the resistance to compression in the fibers on the opposite sides of the neutral axis. These considerations determine more or less the desirable position of the reinforcing steel, which should be well anchored in the body of the concrete.

APPLICATION TO SHAFT LINING

Referring now to the question of lining a shaft with reinforced concrete and applying the foregoing principles and suggestions, regard must be had, first of all, to the character of the strata to be supported. Rock that is self-supporting may only require a comparatively thin lining that should be well tied back into the formation, at points where there is any tendency to the bulging of the lining.

Where the strata are loose or liable to slip from place, a greater thickness of concrete will be necessary, and this must be proportioned to the degree of support the material is thought to require. This can only be estimated practically from knowledge and observation.

Where the strata contain water provision must be made to collect this water in a suitable water-ring surrounding the shaft. The water that drains into this ring, or basin, should either be pumped directly to the surface or conducted by pipes to the sump at the bottom of the shaft, the former method being preferable in most cases.

In the reinforcement of concrete lining in a circular shaft, steel hoops should be used, spaced at regular intervals apart and connected by vertical rods, bars or rails. In this case, the entire section of the concrete is subject to compression by reason of the pressure behind the lining.

When the form of the shaft is elliptical, the style of reinforcement required is practically the same as in the circular shaft. The thickness of the concrete lining, however, should be somewhat greater in the ends of the shaft than on the faces, because of the concentration here, of the pressure exerted on the longer faces of the shaft. The face reinforcement, in this case, should consist preferably of curved steel rails, since the conditions here approximate those of a beam uniformly loaded, or a flat arch.

In a rectangular shaft, the reinforcement of both the faces and ends of the shaft must be considered after the manner of beams uniformly loaded. In all of these cases, the unit pressure can only be assumed in accordance with the conditions existing in the strata.

Examination Questions

Alberta Examination for First-Class Certificates—1914 and 1915

(Answered by Request)

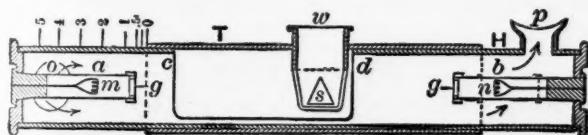
Ques.—Describe fully any method of testing the percentage of marsh gas (CH_4) in the return airway, other than by a safety lamp. In a large mine yielding marsh gas, how often would you make such tests?

Ans.—The Shaw gas machine has been largely used for this purpose, but the size of the machine requires that samples of the mine air be taken to the surface to determine the percentage of gas.

The sample of gas and air is then pumped into a combustion chamber together with different proportions of pure air and exploded, the point at which explosion takes place determining the percentage of gas that is present in the air.

Portable indicators of more or less practical value have been designed by Dr. Angus Smith, Aitken and Liveing. The Aitken indicator showed the approximate percentage of gas present in the mine air by the difference in the readings of two thermometer bulbs, one of which was coated with a thin layer of plaster of paris mixed with platinum black. The absorption of the gas present in the air by the platinum black raised the temperature of that bulb in proportion to the percentage of gas present.

Both the Smith and Liveing indicators depended on burning out the gas from the air by means of a platinum wire rendered incandescent by an electric current. The



SECTION OF THE LIVEING GAS INDICATOR

most practical of these was the Liveing indicator, shown in the accompanying figure, and described on page 311, "Mine Gases and Explosions"—Beard.

An indicator recently designed by G. A. Burrell is similar to the earlier forms designed by Monnier, Coquillion and Maurice, in which the gas contained in the air was burned out by an incandescent platinum wire and the volume of the residual products measured by a graduated scale. The Burrell indicator differed from these earlier forms only in the fact that the indicator contained water by which the burnt air and gases were cooled when the device was shaken. This, however, introduces an element of uncertainty by reason of the possible absorption of the air and gases by the water when shaken, and the escape of the products of the combustion through the relief valve should the mixture be explosive.

Ques.—State the characteristics of the coal seam you would consider most dangerous from a dust standpoint.

Ans.—A coal that disintegrates readily under the action of the air and is easily reduced to a fine dust, particularly when containing a high percentage of volatile

combustible matter, presents the greatest danger from a dust standpoint. The danger is much greater if the seam or the adjacent strata generate marsh gas. Some coals absorb oxygen from the air more readily than others and are more dangerous on this account. Seams that are mined by machines generally produce a large amount of fine dust, which should be carefully loaded out of the mine in dustproof cars.

Ques.—A mine is ventilated by a fan connected with the return airway. The fan is running at its maximum speed, but the ventilation is inadequate. If a fan is placed at one of the intake openings and used to force air into the mine, what effect will this have on the ventilation of the mine?

Ans.—The fan already working on the return airway is exhausting air from the mine, thereby causing a current of air to enter the mine through the intake opening under the pressure of the atmosphere. If a blowing fan is now installed at the intake opening, for the purpose of assisting the circulation of air through the mine, the current due to the action of the exhaust fan must enter and pass through the blower with a velocity due to the depression caused by the exhaust fan.

Assuming the fans are of the same style and dimensions and running at the same speed, they are capable of producing respectively an equal depression and compression within the mine. But, the fact that the depression caused by the exhaust fan creates the velocity with which the air enters the blower makes it clear that until the latter is able to pick up this air or, in other words, overcome the depression due to the exhaust fan, it can do no work in the circulation of the mine. Such an arrangement is described as "tandem" or "in series" and is always inefficient. Where two fans are employed to produce a circulation in a mine, they should work in parallel and not in series. Either both should act as exhaust fans or both as blowers.

Ques.—Smoke is discovered in the return airway of a mine that yields inflammable gas. State fully what action you would take.

Ans.—Immediate steps should be taken to warn the men working in the different sections of the mine and, at the same time, to ascertain the source of the smoke or section of the mine from which it comes. The alarm should be given promptly by notifying the office on the surface and the men underground whose duty it is to man the fire-fighting apparatus and get water to the seat of the fire as quickly as possible.

All the men should be ordered to withdraw from the mine, and no chances should be taken by assuming that the fire is of small proportions and can be easily controlled, unless it is known with certainty that there is no cause for unusual alarm. No one should be permitted to enter the return airway. It is assumed here that the haulage road is the main intake airway of the mine and the men are hoisted as quickly as they arrive at the shaft bottom, care being taken to avoid confusion.

Current Prices—Materials and Supplies

IRON AND STEEL

Pig Iron—Below are the present quotations, with a comparison of a months and a year ago:

CINCINNATI	Apr. 30, 1917	One Month Ago	One Year Ago
No. 2 Southern foundry.....	\$37.90	\$32.90	\$17.90@18.40
No. 2 Northern foundry.....	.....	37.26	20.26
NEW YORK			
No. 2X Northern foundry.....	41.50	40.70	20.25@20.75
No. 2 plain Northern foundry..	.....	39.20	20.25@20.50
No. 2 Southern foundry†.....	.....	34.25	20.25@20.50
BIRMINGHAM			
No. 2 Southern foundry.....	35.00	30.00	15.00
CHICAGO			
No. 2 Northern foundry.....	41.00	38.00	19.00
PITTSBURGH			
Bessemer iron*	42.95	38.95	21.95
Basic iron*	40.00	35.00	18.95

*These prices include the freight charge from the valley to the Pittsburgh district. †Delivered Tidewater, New York.

Structural Material—The following are the base prices f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Pittsburgh	St. Louis	Chicago
Beams, 3 to 15 in.....	\$3.80	\$4.55	\$4.75
Channels, 3 to 15 in.....	3.80	4.55	4.75
Angles, 3 to 6 in., ¼ in. thick.....	3.80	4.55	4.75
Tees, 3 in. and larger.....	3.80	4.55	4.80
Plates	5.50	6.05	6.00

Bar Iron—Prices in cents per pound at cities named are as follows:

	Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
Mar. 30, 1917....	3.75	4.35	4.25	3.95	4.25

Nails—Prices per keg from warehouse in cities named:

	Mill, Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
Wire	\$3.50	\$3.90	\$4.00	\$4.05	\$4.10
Cut	3.75	.....	4.45	.....	.....

Track Supplies—Prices are base per 100 lb. f.o.b. Pittsburgh, and from warehouse at cities named:

	Mill, Pittsburgh	Cincinnati	Denver	Birmingham
Standard railroad spikes.....	\$3.85	\$4.25	\$4.15	\$5.00
Track bolts	5.35@5.50	6.25	5.00	6.00
Standard section angle bars..	2.75	4.25	3.00	.....

Cold Drawn Steel Shafting—From warehouse to consumers requiring fair-sized lots, the following discounts held on Apr. 30, 1917:

	Cleveland	Cincinnati	St. Louis	Denver	Birmingham
List	+10%	+5%	+30%	+30%	.....

Horse and Mule Shoes—Warehouse prices per 100 lb. in cities named:

	Cincinnati	St. Louis	Denver	Birmingham
Straight	\$6.25	\$5.85	\$7.00	\$6.00
Assorted	6.50	5.95	7.25	6.15

Cast-Iron Pipe—The following are prices per net ton for carload lots:

	Birmingham	Chicago	St. Louis
4 in.	\$53.00	\$58.15	\$57.00
6 in. and over.....	50.00	55.15	54.00

Gas pipe and 16-ft. lengths are \$1 per ton extra.

Steel Rails—The following quotations are per 100 lb. f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh	Chicago
Standard bessemer rails	\$38.00	\$38.00
Standard openhearth rails	40.00	40.00
Light rails, 8 to 10 lb.	58.00	58.00
Light rails, 12 to 14 lb.	57.00	57.00
Light rails, 25 to 45 lb.	55.00	55.00

Old Material—Prices per net ton in Chicago and St. Louis (including delivery to buyer's works and freight transfer charges):

	Chicago Apr. 30, 1917	1 Mo. Ago	St. Louis Apr. 30, 1917	Price Delivered 1 Mo. Ago
No. 1 railroad wrought..	\$32.00	\$27.50@28.00	\$28.00@29.00	\$26.75*
Stove plate	14.50	12.50@13.00	30.50@31.00	27.25
No. 1 machinery cast...	21.50	13.25@18.75	14.00@14.50	12.25
Machine shop turnings..	10.50	9.50@10.00	21.50@22.50	17.25
Cast borings	11.00	10.00@10.50	10.50@11.00	10.25
Railroad malleable cast..	21.50	18.50@19.00	20.50@21.00	18.25

*Gross ton.

Freight Rates—On finished steel products in the Pittsburgh district, including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc., the following freight rates are effective in cents per 100 lb.:

	Baltimore	Buffalo	Chicago	Cleveland	Pacific Coast (all rail)	Philadelphia	St. Louis	Denver
.....	15.40	11.60	18.90	10.50	65.00	15.90	23.60	68.60

EXPLOSIVES AND ACCESSORIES

Dynamite—Prices per pound f.o.b. nearest railroad stations in Ohio, Indiana, Illinois, Michigan, Wisconsin and Dubuque County, Iowa, are as follows:

Low-Freezing Ammonia	Carload of 20,000 lb.	Ton Lots	200-Lb. Lots*
40%	15½	17	18¼
60%	19½	21	22¼
Low-Freezing Gelatin			
40%	18	19½	20¾
60%	25	25½	26¾

*Less than 200 lb., f.o.b. shipping point.

Price in cents per pound at cities named:

	Low Freezing	40%	60%	80%
Cincinnati .....	.15½	.18¼	.22¼	.33¼
Kansas City .....	.16	.21	.27	.33½
New Orleans .....	.17½	.19¾	.23¾	.....
Chicago .....	.14½	.19	.25	.32

Blasting Powder—Price per keg:

	Carload Lots Delivered	Less Than Car Lots
Ohio, f.o.b. Columbus.....	400 kegs \$1.50	\$1.80
Indiana, f.o.b. Aetna.....	800 kegs 1.55	1.80
Indiana, f.o.b. Indianapolis.....	.....	1.80
Illinois, f.o.b. Chicago.....	400 kegs 1.57½	1.80
Iowa points on Mississippi River, f.o.b. St. Louis.....	.....	1.80
Missouri points on Mississippi River, f.o.b. Des Moines.....	.....	1.85
Missouri points on Mississippi River, f.o.b. Saginaw.....	.....	1.90
Michigan, So. Peninsula only, f.o.b. Kansas City.....	.....	1.90

Above prices are for CC, C, F, FF, FFF sizes. Price on FFFF size 5c. per keg advance over above prices.

Safety Fuse—Prices f.o.b. New York, Chicago, per 1000 ft., less quantity discount:

Cotton	\$6.65	Beaver	\$6.75
Single tape	6.85	Anchor	7.65
Double tape	7.75	Crescent	7.65
Triple tape	8.60	.....	.....

Blasting Caps—List price of blasting and electric blasting caps f.o.b. shipping points in states named:

	Electric Blasting Caps, Copper Wire				Blasting Caps	
	No.	4 Ft.	6 Ft.	8 Ft.	10 Ft.	No. p. 1000
Ohio, Indiana, Illinois and So. Michigan	6	\$6.00	\$7.00	\$8.00	\$9.00	5 \$14.00
.....	8	8.00	9.00	10.00	11.00	6 17.00
.....	6	6.10	7.11	8.12	9.13	5 14.15
Missouri, Iowa and No. Michigan	8	8.10	9.11	10.12	10.13	6 17.15
.....	.....	.....	.....	.....	8	28.25

SHOP SUPPLIES

Nuts—From warehouse at the places named, on fair-sized orders, the following amount is deducted from list:

	Cleveland Apr. 30, 1917	6 Mo. Ago	Chicago Apr. 30, 1917	6 Mo. Ago
Hot pressed square.....	\$1.90	\$3.00	\$3.00	\$3.00
Hot pressed hexagon.....	1.90	3.00	3.00	3.00
Cold punched square.....	1.40	2.00	2.50	2.50
Cold punched hexagon....	1.60	2.75	3.00	3.00

Semifinished nuts sell at the following discounts from list price:

	Apr. 30, 1917	Six Months Ago
Cleveland	45%	65—10%
Chicago	50—10%	70%

Machine Bolts—From warehouses at the places named the following discounts hold:

	Cleveland	Chicago
¾ by 6 in. and smaller.....	35—2½%	35—5%
Larger and longer up to 1 in. by 30 in.....	25%	20—2½%

At this rate the net prices per 100 lb. are:

	Cleveland			Chicago		
	¼	½	1	¼	½	1
2	\$1.12	\$2.90	\$12.00	\$1.10	\$3.01	\$12.18
2½	1.18	3.09	12.68	1.15	3.22	13.18
3	1.23	3.29	13.35	1.20	3.42	13.88
3½	1.27	3.48	14.03	1.24	3.62	14.59

MISCELLANEOUS

Greases—Prices are as follows in the following cities in cents per pound for barrel lots:

	Chicago	St. Louis	Birmingham	Denver*
Cup	6	40	7¼	\$32.00
Fiber or sponge	6¼	52	.....	56.00
Transmission	6¼	52	10	52.00
Axle	3½	3½	3¾	16.00
Gear	5	3	5¼	24.00
Car journal (S. & F.)	4½	9½	2½	10.00

*Per barrel.

Wrought Washers—From warehouses at the places named the following amount is deducted from list price:
 Cleveland \$5.50 Chicago \$5.00
 For cast-iron washers the base price per 100 lb. is as follows:
 Cleveland \$3.00 Chicago \$3.00

Common Brick—The prices per 1000 in cargo or carload lots are as follows:
 Cincinnati \$10.50 Birmingham (clay) \$7.50
 St. Louis 7.00 Birmingham (shale) 8.50
 Denver 8.00

Leather Belting—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
Cincinnati	50%	40%
St. Louis	45%	40%
Denver	45%	40%
Birmingham	40%	35%

Rawhide Lacing—40% off list.

Packing—Prices in cities named are as follows:

	Cincinnati	Denver	St. Louis	Chicago
Valve and Stung-Box				
Twisted plain, 25-lb. cartons.....	\$1.35	\$1.25	\$1.40	\$0.80
Twisted graphite, 25-lb. cartons.....	1.75	1.25	1.40	.90
Braided plain, 25-lb. cartons.....	1.35	1.50	1.40	1.00
Braided graphite, 25-lb. cartons.....	1.75	1.50	1.40	1.10
Steam (in 25- and 50-lb. cartons)				
First grade .....	.85	.80		.75
Second grade .....	.75			.50
Piston (in 25- and 50-lb. cartons)				
Asbestos, duck and rubber.....	.90	1.50		1.25
Flax, first grade .....	.40	.60		.85
Rubber and duck .....	.80	.75		.90

White and Red Lead, in cents per pound, sell as follows:

	Red	White
	Apr. 30, 1917 6 Months Ago	Apr. 30, 1917 6 Months Ago
	Dry In Oil Dry In Oil	Dry In Oil Dry In Oil
100-lb. keg	11.25 11.50 10.50 11.00	11.00 10.50
25- and 50-lb. kegs	11.50 11.75 10.75 11.25	11.25 10.75
12½-lb. keg.....	11.75 12.00 11.00 11.50	11.50 11.00
1 to 5-lb. cans.....	13.25 13.50 12.50 12.50	13.00 12.50

Pipe—The following discounts are for carload lots f.o.b. Pittsburgh, in effect Apr. 2, 1917:

	Steel	Lap Weld	Iron
Inches	Black Galvanized	Inches	Black Galvanized
2	48% 35½%	1½	29% 14%
2½	51% 37½%	1½	36% 22%
3	48% 34½%	2	37% 23%
3½	48% 34½%	2	37% 23%
4	38½%	2½	39% 26%
5	36%	3	39% 26%
		4	38% 25%
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		99	
		100	

From warehouses at the places named the following discounts hold for steel pipe:

	Black	Galvanized
	Chicago St. Louis	Chicago St. Louis
¾ to 3 in. butt welded.....	48.8% 47.27%	33.8% 32.27%
3½ to 6 in. lap welded.....	44.8% 43.27%	30.8% 29.27%
7 to 12 in. lap welded.....	41.8% 40.27%	26.8% 25.27%

Pipe and Boiler Covering—Below are discounts and part of standard lists:

	PIPE COVERING	BLOCKS AND SHEETS
Pipe Size	Standard Thickness Per Lin.Ft.	Thickness Price per Sq.Ft.
1-in.	\$0.27	1½-in. \$0.27
2-in.	.36	1-in. .30
3-in.	.45	1½-in. .45
4-in.	.60	2-in. .60
6-in.	.80	2½-in. .75
8-in.	1.10	3-in. .90
10-in.	1.30	3½-in. 1.05

55% magnesia high pressure..... 15% off

Air cells for low-pressure heating and return lines { 4-ply..... 58% off
 3-ply..... 60% off
 2-ply..... 62% off

Lamps—Below are present quotations in less than standard package quantities:

	Straight-Side Bulbs	Pear-Shape Bulbs
	No. in Package	No. in Package
Mazda B-10	100	75
Watts Plain	100	75
10	\$0.27	\$0.30
15	.27	.30
25	.27	.30
35	.27	.30
45	.27	.30
55	.27	.30
65	.27	.30
75	.27	.30
85	.27	.30
95	.27	.30
105	.27	.30
115	.27	.30
125	.27	.30
135	.27	.30
145	.27	.30
155	.27	.30
165	.27	.30
175	.27	.30
185	.27	.30
195	.27	.30
205	.27	.30
215	.27	.30
225	.27	.30
235	.27	.30
245	.27	.30
255	.27	.30
265	.27	.30
275	.27	.30
285	.27	.30
295	.27	.30
305	.27	.30
315	.27	.30
325	.27	.30
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745	.27	.30
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765	.27	.30
775	.27	.30
785	.27	.30
795	.27	.30
805	.27	.30
815	.27	.30
825	.27	.30
835	.27	.30
845	.27	.30
855	.27	.30
865	.27	.30
875	.27	.30
885	.27	.30
895	.27	.30
905	.27	.30
915	.27	.30
925	.27	.30
935	.27	.30
945	.27	.30
955	.27	.30
965	.27	.30
975	.27	.30
985	.27	.30
995	.27	.30
1005	.27	.30

Standard package quantities are 10% from above prices. Yearly contracts ranging from \$150 up allow a discount of 17% from list.

Babbitt Metal—Quotations are as follows in cents per pound from warehouse at the places named:

	Cleveland	Chicago
	Apr. 30, 1917 6 Months Ago	Apr. 30, 1917 6 Months Ago
Best grade	65.75 49.25	62.00@65.00 45.00
Commercial	20.75 16.75	25.00@30.00 19.00

Manila Rope—Price in coils per lb. in cities named, ¾ to 1½ in.:

Boston	\$0.27	Los Angeles	\$0.23½
Cincinnati .....	.27	San Francisco .....	.25
Kansas City .....	.26½	Seattle .....	.26½
New Orleans .....	.26	Denver .....	.28
Chicago .....	.25½		

Wire Rope—Discounts from list price on regular grades of bright and galvanized are as follows:

	Apr. 30, 1917	One Year Ago	St. Louis	Chicago	Dallas
Galvanized ... 15-2½%	25-2½%	35-2½%	10-2½%	15-2½%	7½-12½-5%
Bright ... 25-2½%	35-2½%	20-2½%	25-2½%	17½-12½-5%	

Lumber—Price per M in carload lots:

	1-In. Rough, 10 In. x 16 Ft. and Under	2-In. T. and G., Dressed and Matched (10 In. x 16 Ft.)
	Y.P. Fir Hemlock	Y.P. Fir
Cincinnati	\$35.00	\$36.50
Kansas City	47.25	44.75
Denver	23.00	23.00
New Orleans*	35.00	40.00
Chicago	27.00	25.00

*Cypress available instead of fir.

	Southern Pine	Yellow Pine
	20 Ft. and Under	22-24 Ft. 20 Ft. and Under 22-24 Ft.
4x4 to 8x8	\$28.75	\$29.75
3x10 to 10x10	29.75	30.75
3x12 to 12x12	32.75	33.75
3x14 to 14x14	34.75	35.75
3x16 to 16x16	37.75	38.75
3x18 to 18x18	41.75	42.75
4x20 to 20x20	46.75	47.75

Over 32 ft.—Add \$1 for each additional 2 ft. in length up to 40 ft. for sizes 12x12 and under; for sizes over 12x12 add \$2. For merchantable add \$2 to sizes 10x10 and under. For prime add \$2 to the price of merchantable for all sizes.

Linseed Oil—These prices are per gallon:

	Cleveland	Chicago
	Apr. 30, 1917 6 Months Ago	Apr. 30, 1917 6 Months Ago
Raw in barrels.....	\$1.25 \$0.97	\$1.20 \$0.92
5-gal cans	1.35 1.07	1.30 1.02

Boiled, 1c. per gal. additional.

Copper Wire—Prices in cents per foot for rubber-covered wire in standard quantities of 1000 ft.

	St. Louis	Denver	Birmingham
No.	Single Braid Double Braid Duplex	Single Braid Double Braid Duplex	Single Braid Double Braid Duplex
14	\$14.00 \$16.00 \$28.00	\$13.10 \$17.55 \$31.60	\$15.00 \$18.80 \$37.60
10	29.65 33.15 71.00	28.55 32.25 63.95	36.80 35.30 70.60
8	42.95 46.95 93.40	40.80 45.05 89.75	45.35 49.35
6	72.70	69.15	71.80 76.80
4	116.20	99.95	101.00 110.80
2	170.00	150.15	162.50 169.00
1	223.00	194.35	208.50 217.00
0	271.50	233.75	286.00 295.50
00	335.50		351.50 362.00
000	409.00		432.50 444.00
0000	499.50		528.00 541.00

*Not approved by underwriters. †No stock.

Calcium Carbide—Price f.o.b. cars at warehouse points in Eastern States is \$82.50 per ton for Cameo, \$87.50 for Union.

Hose—Following are prices of various classes of hose:

	Fire	Air
	50-Ft. Lengths	First Grade Second Grade Third Grade
Underwriters', 2½-in.	55@60c. per ft.	
Common, 2½-in.	60% from list	
¾-in., per ft.	\$0.45 \$0.25 \$0.18	
First grade..... 33½%	Second grade..... 40%	Third grade..... 50%

Roofing Materials—Prices per 100 lb. f.o.b. Chicago or St. Louis:

Tar felt (14 lb. per square of 100 sq.ft.).....	\$2.75
Tar pitch (in bbl. of 400 lb. each).....	.60
Asphalt pitch (in bbl. of 400 lb. each).....	3.25
Asphalt felt	1.40

Prepared Roofings—Standard grade rubbered surface complete with nails and cement costs per square as follows in Chicago or St. Louis:

	1-Ply	2-Ply	3-Ply
No. 1 grade.....	\$1.40	\$1.65	\$1.90
No. 2 grade.....	1.25	1.50	1.75

Coal and Coke News

Washington, D. C.

Supplementing the hearing of the bituminous coal operators held the third week in April, the Federal Trade Commission invited railroad executives to testify last week regarding the phases of the problem in which they are concerned. In this manner the Commission is attempting to determine why the price of coal advanced, and hopes that by giving the causes full publicity the condition may be remedied. The purchasing agents of the coal-carrying railroads denied at the hearings last week that they were responsible for the high prices of bituminous coal. Some of them charged the advances to the law of supply and demand, some to the rush on the part of the public to store coal and others to the failure of connecting lines to return cars promptly.

At previous hearings the coal operators declared that the failure of the railroads to furnish cars is one of the chief reasons for the high prices now prevailing. Figures showing greatly increased prices for coal, some of them ranging from 50 to 100 per cent. were laid before the Federal Trade Commission last week by the railroad representatives. Several said that the roads, by furnishing cars to the mines for transporting their own supply, would get the coal at from 50 to 75c. a ton cheaper. It also was said that there was a general reluctance to make new contracts to furnish the railroads with coal, the operators preferring to wait for future developments.

In new contracts, the witnesses said, provisions are made for the amending of these instruments in case increases in wage are made to the mine workers. Similar provisions are made, protecting the operator in the event of the passage of unfavorable Federal or State legislation and in other like contingencies. The representatives of the New York, New Haven & Hartford R.R. declared that about 60 per cent. of the railroad's fuel supply was received by water and that the scarcity of vessels, caused by so many being diverted from the coastwise trade to transatlantic service, had made their coal cost increase more than that of other railroads. The coal hearings will be further supplemented by testimony from the representatives of public utilities, industrial plants and the general public.

Orders directing the railroads of the country to give coal and iron ore preference over all other traffic were issued by the general railroad board of the Council of National Defense last week. This railroad board was organized about two weeks ago by the railroad heads to operate American railway lines as one continental system during the war. On announcing its first important move since organizing, the board declared the welfare and safety of the nation depended on adequate supplies of coal and iron, and that evasion of the order would call for the strictest disciplinary measures. Railroad presidents will be charged personally with responsibility for carrying the order into effect.

New emergency car-service rules, drawn by the American Railway Association's Car Service Commission, made public in connection with the board's order, require that coal and ore cars when emptied must be sent loaded or empty either directly to or in the general direction of home roads. Foreign box-cars also must be sent, loaded if practicable, in the direction of home roads.

The general railroad board or executive committee comprises five members, with Fairfax Harrison, president of the Southern Ry., at its head. The other members are Howard Elliott, of the New York, New Haven & Hartford R.R.; Hale Holden, of the Chicago, Burlington & Quincy R.R.; Julius Kruttschnitt, of the Southern Pacific R.R., and Samuel Rea, of the Pennsylvania R.R. Serving as ex-officio members are Daniel Willard, president of the Baltimore & Ohio and a member of the Defense Council's advisory commission, and E. E. Clark, of the Interstate Commerce Commission.

The announcement said, among other things: "The action of the executive committee to day . . . follows their pledge of Apr. 11 to the government and the American people that during the war with Germany they would coordinate their operations in a continental railway system, merging all their merely individual and competitive activities in an effort to produce a maximum of national transportation efficiency."

The board declared it realizes that opportunities are often discovered, by interpretation or otherwise, to evade the spirit of rules governing the distribution and use of cars and said: "The board therefore deems it its duty to state that it will and does require that the president of each road personally to regard it as a special charge upon his good faith and upon that of his

railroad, to see that this rule is not evaded or abused, but is applied to accomplish daily the purpose intended. If failure occurs, this committee will take prompt and effective steps to correct all such cases by disciplinary measures, including the publication, where deemed necessary, of names of officers and railroads refusing or failing to respond to this appeal."

Hearings on Freight Increases

Preparations have been made by the Interstate Commerce Commission to hear, during the current month, the testimony and arguments regarding the general 15 per cent. freight-rate advance in the hope of concluding the hearing and issuing a tentative decision prior to July 1. A summary of the plans of the commission in this regard have been announced in the following notice:

"The Interstate Commerce Commission has readjusted its calendar for the month of May so as to set apart the week beginning May 7 for hearings before the commission on carriers' proposals to generally increase freight rates, and the protests thereto. The hearings will be held in the ball room of the Raleigh Hotel, in Washington, D. C., beginning at 10 a.m. During those six days it expects that the carriers will present their case. Hearings will be resumed on May 23, and it has been suggested that the full presentation of the carriers' side may be facilitated if cross-examination of their witnesses is deferred until the subsequent hearings. This will give the representatives of shippers and of the public additional opportunity in which to prepare to cross-examine, as well as to prepare their case in chief against the increases.

The hearings will be continued until adequate opportunity has been afforded for the presentation of such matters as in the opinion of the commission may aid it in determining whether or not it should suspend all or any of the supplements carrying the proposed increases, or require modification thereof as a condition of their becoming effective on July 1, their proposed effective date."

New Rates to be Canceled

The Interstate Commerce Commission rendered a decision during the past week upon the complaint of the Valley Smokeless Coal Co. and others against the Pennsylvania and other railroads. The commission condemned the proposed increase in through rates to eastern destinations on coal from mines on the Johnstown & Stony Creek R.R., and directed the roads to cancel the new rates. The decision required the roads to extend the Clearfield district rates so that they would apply to coal shipped from mines of the complainants.

In regard to the complaint of the La Crosse Shippers' Association, the commission approved the rates on bituminous coal in carloads from various producing points in West Virginia to La Crosse, Wis. The commission also approved similar rates to La Crosse from various producing points in Illinois, from St. Louis, Mo., and from points taking the same rates. The railroads were authorized to continue and to establish the same rates on bituminous coal from certain Lake Michigan ports to Eau Claire, Chippewa Falls, Menomonee Junction and Menomonee, Wis., as are in effect from Duluth, Minn., to the same destinations, and to continue higher rates to certain intermediate points on their lines, provided that the rates to intermediate points from Lake Michigan ports shall not exceed the rates on like traffic from Duluth and that present rates to said intermediate points are not exceeded. Finally the commission decided in this case that the requirement of a differential between bituminous screenings and other sizes is not justified.

Dismissing another complaint of the La Crosse Shippers' Association the commission approved the rates on coke in carloads from Indianapolis, Ind., and from Chicago, Joliet and Peoria, Ill., to La Crosse.

A fourth decision issued by the commission condemned the proposed increased rates on coal and coke in carloads to points in Texas, Oklahoma and Louisiana from producing points in Colorado and New Mexico except as to certain specified points of minor consequence.

Upon a rehearing of the complaint of G. I. Morre, the commission affirmed its previous finding that the rate on coal from southern Illinois mines to Hazel Spur, Mo., is reasonable, and the denial of the application of the Chicago & Eastern Illinois Railroad Co. to continue rates on coal from these mines to Chaffee and Cape Girardeau, Mo., lower than the rates contemporaneously applicable on like traffic to Illmo, Mo., and other intermediate points. The commission declared that the rates from the same mines to Illmo, Rockview, Mo., Chaffee and Cape Girardeau have not been shown to be unreasonable.

Long and Short Haul Decision

A long-and-short-haul decision has been issued by the Interstate Commerce Commission denying the application of the Chicago, Milwaukee & St. Paul Ry. to establish a rate of 75c. per ton on hard and soft coal in carloads, from Marinette, Wis., and Menomonee, Mich., to Green Bay, Wis., without observing the long-and-short-haul provision of the act to regulate commerce.

In answer to an application of F. A. Leland, agent for the railroads, the commission entered a long-and-short-haul order authorizing these roads to establish certain specified rates on coke in carloads with a minimum weight of 45,000 lb. except where the cars are loaded to full visible or space-carrying capacity, in which event the actual weight shall rule, but that weight shall not be less than 40,000 lb. The rates thus ordered by the commission are the same as those contemporaneously in effect on coal from McCurtain, Okla., to points in Texas, the commission setting aside the long-and-short-haul provision of the act to regulate commerce as it is empowered to do under certain circumstances.

HARRISBURG, PENN.

Fatalities have been much more numerous among the industrial workers of Pennsylvania during the first three months of 1917 than for the same period in 1916. For this reason the chief of the department of mines is pleased to be able to state in contradiction that there has been a decrease of 25 per cent. in fatalities among the mine workers of the state for this period as compared with the same period last year.

In the anthracite region during the first three months of last year, 190 lives were lost, while during the present year the number has been 137. Thus there has been a decrease of almost 28 per cent. The figures for the bituminous region are given as 144 deaths for 1916 and 118 for this year, or a decrease of 18 per cent. Yet during this period for 1917, two serious gas explosions occurred in this region, causing the loss of 18 lives.

The greatest decrease in accidents in the anthracite region was from explosions of gas, while in the bituminous region, the main decrease was secured by reducing the number of accidents from falls.

The coal-tax bill, which has been approved by the administration and by the joint revenue commission of the legislature, made its appearance in the House on Apr. 24. It is sponsored by James F. Woodward, chairman of the House Appropriations Committee, and was presented together with bills imposing taxes upon natural gas, the capital stock of corporations heretofore exempted, and crude petroleum.

In the Woodward Bill No. 1579, bituminous coal, as well as anthracite, is taxed 2 per cent. of its market value. The bill provides that the State shall receive all the proceeds of the coal tax, with a provision that 50 per cent. of the money collected shall be turned over to the State Highway Department for repairs and improvements to state roads.

Mr. Woodward expressed surprise when his attention was called to the fact that his bill did not provide for a portion of the money being returned to the counties from which the coal is taken, and said that the bill would be amended to meet the wishes of the commission, which intended that the act should provide that the coal districts receive one-half of the tax collected.

It is said that the Woodward bill will be substituted for the Davis bill placing a tax of 2½ per cent. on bituminous coal and anthracite.

A bill authorizing churches, cemetery companies and burial associations to lease or convey coal and other minerals, providing for the use and expenditure of the money derived therefrom, and providing for the support of the overlying surface was presented to the House by Representative Sinclair of Fayette County.

The bill provides that coal sold or leased under such conditions must not be mined out so as to endanger the surface, and requires that 50 per cent. of the mineral must be left in place for support. The money derived from the sale or lease of the coal must be spent in beautifying, endowing, maintaining or extending properties. The most interesting feature connected with the presentation of the bill is that no person seems to know why it was introduced or who is interested in its introduction, but it is thought that a prominent coal lobbyist is back of the bill.

Representative Powell, has introduced a bill providing for the examination, qualification and election of mine inspectors in the anthracite region. If this bill becomes a law, all inspectors who have passed two regular examinations for the office of mine inspector and have been twice elected to said office shall be continued in office without further examination

or election. It is said that the bill will probably be amended in committee so that one examination and election will qualify an inspector indefinitely thus meeting the views of the chief of the Department of Mines and of the governor.

At the request of Governor Brumbaugh, Representative Woodward, has introduced a bill authorizing the chief executive should the War make it necessary to suspend by proclamation all restrictions relating to labor contained in any law of the state.

The legislation is to be rushed through, according to the plans of the administration in order that Pennsylvania's laws regulating labor in various industries may be set aside for the period of the war should the necessity to assure increasing production arise. The bill recites that a state of war exists and that the Council of National Defense has called on the legislature to give the governor power to suspend labor laws in force for a period not longer than the continuance of the war.

Senator Sproul has introduced a bill which is said to be backed by many large manufacturing and mining concerns, which authorizes the several courts of common pleas to appoint volunteer police officers during the present war. The police officers when so appointed and qualified shall have and possess all the powers of police officers of the several cities and boroughs of the Commonwealth and are authorized with or without warrant to arrest on sight any person caught committing any offense against the laws of the state, or of the United States.

It was hoped that the persons who have suffered from the mine caves in the anthracite region would be willing to accept the provisions of the Ramsey bill as a sufficient guarantee of the safety of their lives and property. This bill would vest in the mine inspectors the right to regulate mining so as to prevent in the future the caving of the surface under buildings and other property.

The hope that an amicable adjustment would be reached was destroyed on Apr. 25 when the council for the mine cave victims and other representatives of their interest flatly refused before the Mines and Mining Committee to accept the Ramsey bill as satisfying their demands for protection.

Former Judge F. W. Wheaton, chief counsel for the Lehigh Valley Coal Co., and speaking for all the anthracite coal companies, made the compromise offer and its hasty refusal by the head of the Scranton Surface Protective Association was not taken kindly by chairman Baldwin of the Senate and Ramsey of the joint committee.

Judge Wheaton said that the operators are prepared to support a bill based on the report of the Tener Commission and if that did not please the association they were willing to give their support to the Ramsey bill, which has been offered by the Scranton Board of Trade as a basis of settlement. He said the people are suffering from a technical and legal construction of a contract, and that the companies are ready to accept any equitable, decent, just relief, but that the Scarlet bill does not attempt any remedy. It is simply restrictive.

"We have no objections to the Ramsey bill," Judge Wheaton said. "Properly supplemented as it will have to be, it ought to afford a remedy for the surface owner and conserve the property of the operators as well."

The operators' and miners' conference in New York prevented the attendance of some of the members of the commission appointed by Governor Tener, but a further conference will be agreed upon by the committee to get the views of the members of this commission.

PENNSYLVANIA

Anthracite

Hazleton—A class of labor entirely new to the anthracite coal fields has just arrived here from Spain. The Spaniards have been in the country since Mar. 14 and so satisfactory have they been that additional numbers are expected shortly to take the place of many men who are leaving the region daily.

Mahanoy City—The Stanton coal breaker at Gilberton has been closed down because of the large number of employees who have enlisted in the various army and navy services since the beginning of war with Germany. In one day recently 12 men enlisted and every day others are leaving for the same purpose. The coal mined at the Stanton colliery will now be prepared at the Lawrence breaker.

Cranberry—The Lehigh Coal and Navigation Co. offers prizes of \$10, \$6 and \$4 to its employees at Cranberry, Crystal Ridge and Harwood collieries, who cultivate the best gardens this season.

Shamokin—Unknown persons recently set fire to timber on the mountain south of the Philadelphia & Reading Coal and Iron Co.'s Henry Clay shaft, and in a brief period the breaker structure was endangered. State fire wardens and state police with company employees saved the structure and kept the flames away from culm banks and air holes leading into the mine. Acres of young timber was burned.

Nanticoke—Loomis colliery, of the Delaware, Lackawanna & Western R.R. Co., was recently

the scene of another gas explosion that proved fatal to two young men. The explosion occurred when a spark from the trolley pole of a motor came in contact with the gas, thus enveloping the men with the flames.

Maizeville—Madeira-Hill & Co. has abandoned the Stanton breaker and will prepare all coal mined there at the Lawrence breaker, at Mahanoy Plane. Due to young men enlisting in the United States Army, Madeira-Hill & Co. had to unite two breaker forces.

Harwood—Three officials of the Lehigh Coal and Navigation Co. and a miner were overcome by fumes and six mules smothered on Apr. 27, in a mine fire at Cranberry No. 5 mine, where an oil tank of one of the engines got ablaze, causing flames to spread to the coal and timbers. J. E. Anderson, superintendent; Donald Markie, mining engineer; David MacFarlane, mine foreman, and Drew Kosky, a miner, were made unconscious by the gas, but were resuscitated after being rescued. All are fully recovered. It took 10 hours to extinguish the flames.

Shenandoah—Judge Henry, of Lebanon County, has consented to hear one of the most important mining cases ever tried in the anthracite region. The suit involves the right of the Girard Estate and lessees to undermine the surface at Shenandoah in such a way as might endanger millions of dollars worth of real estate. The suit was originally brought by the Homes Brewing Co. against the Thomas Colliery Co., a corporation which leases its land from the Girard Estate, but since then Archbishop Prendergast has intervened on behalf of one of the Catholic churches. An injunction has been issued against the Thomas Colliery Co., preventing the mining of coal amounting in value to many hundreds of thousands of dollars, and an effort is now being made to have this injunction removed.

Minersville—One man was killed at Pine Hill colliery last year, and his death was due primarily to fright. He was loading culm at a bank when the material above him "rushed" and he was so badly frightened that he was unable to help himself. C. H. Strange, the superintendent, is constantly striving to make the place more safe for his men. Each pay statement the men receive contains "safety-first" suggestions of a practical character which are selected from the suggestions brought in by the "safety committee." A prize is given to the employee suggesting the best safety plan during a given period. The judgment of the "safety committee" is final in cases where a man has been guilty of breaking the rules. This committee not only looks into the accident-prevention work, but notes are taken of the sanitary conditions about the colliery and in case these need correction the committee suggests the remedy. Some of the rules recently given to the employees at this mine are enumerated on the pay statements.

Pittston—Examination of candidates for mine foremen and assistant mine foremen's certificates in the Eighth and Ninth Anthracite Inspection districts will be held at the Pittston Y. M. C. A. on May 8 and 9.

Announcement has been made by H. P. Connolly, land agent for the Pennsylvania and the Hillside Coal and Iron companies, of an extension of the companies' policy regarding repairs to property damaged by mine caves. The companies have been quick to repair houses damaged, which are on land not owned by the company, but the extension of the repair plan includes homes on land owned by the company. The new policy will materially benefit Pittston and its vicinity where the caving has affected many houses on company land.

Bituminous

Carrolltown—E. I. Humphries, of Philadelphia, and other Philadelphia capitalists, have purchased the Fisher tract of coal land, about one mile south of Carrolltown. It is stated that a number of other deals are pending and when they are closed the new company will open extensive mining interests in this section.

Indiana—A foreigner employed by the Tide Coal Mining Co., at Tidedale, was recently killed by an explosion of dynamite in one of the company dwellings. It is supposed that he committed suicide in this way as he had previously sent his sister and mother from the house. The house was a complete wreck.

Ligonier—Seger Brothers, of this place, who have purchased large tracts of coal land near Blairsville, have purchased 266 acres in Derry Township, Westmoreland County, for \$320,000. It is the intention of the Seger interests to operate extensively in this field.

Washington—The Pittsburgh Coal Co., of Pittsburgh, on Apr. 28, purchased a block of 2220 acres of coal land, located in this county, the deal involving approximately \$1,000,000. The first of this month the same concern purchased a large acreage in the same section.

Johnstown—Thousands of coal miners in this vicinity have taken up the study of the science of first aid. A new organization of local coal operators has launched a movement for the establishment of a first-aid and mine-rescue station in this city, and as soon as the equipment arrives and can be installed the classes will be

enlarged. The miners are using the first-aid rooms of the Cambria Steel Co. at the present time. The apparatus has been ordered and is expected to arrive any day.

Pittsburgh—The Pittsburgh Coal Co. has acquired over 2000 acres of coal lands in West Bethlehem, South Strabane and Amwell Townships at a price said to be \$1,000,000, and is planning to operate the properties.

WEST VIRGINIA

Fairmont—Declaring for national prohibition, because of their conviction that it is necessary for industrial efficiency, the Central West Virginia Coal Operator's Association on Apr. 24, at one of its largest meetings, passed a resolution directing the chairman and secretary to address a message to the congressmen and senators from West Virginia, urging them to use their influence in furthering the cause of nationwide prohibition.

Work on the side track which is to extend from the Monongahela Ry. to the O'Donnell mine is about completed, and the construction of the tipples has been started. The mine, which is being opened by the Consolidation Coal Co., is expected to be in operation shortly. Another important working of this same company will be opened on the Monongahela Ry. opposite Catawba, and it will probably be in operation by the first of June.

Beckley—The Very Top Seam Coal Co., recently organized by L. M. Dorsey of this place and George Wolf of Winding Gulf, has completed arrangements with the Chesapeake & Ohio R.R. for the construction of a short branch line to the company's lease at Daniels. Plans are now being perfected for letting the work to contractors as soon as possible.

ALABAMA

Birmingham—Coal operators in the Birmingham district granted an increase in wages and salaries of approximately 10 per cent., effective May 1.

The Alabama Coal Operators' Association is carrying on a campaign for home gardening among the coal-mine employees of the district and has assigned H. Clant Miller to the direction of the work. Mr. Miller is visiting the mining camps throughout the district and lecturing to the employees on the subject of home gardening and organizing clubs to foster the work. Operators are lending every assistance possible, and are fencing in plots for gardens and providing free fertilizers and seed at cost. The campaign is proving decidedly successful.

KENTUCKY

McRoberts—The Consolidation Coal Co. is building two welfare and Y. M. C. A. buildings, for both white and colored people, here. The buildings will be of considerable magnitude and modern and up-to-date in every particular.

The Consolidation Coal Co. is donating ground to many of the miners hereabouts to put out gardens and truck patches and assisting them in every way possible. Almost without exception miners are taking advantage of the proposition and are putting out all kinds of vegetables and garden products in efforts to reduce as much as possible the high cost of living.

Seco—The South East Coal Co., operating plants at Seco and LaViers, has purchased property at the Mouth of Millstone Creek, immediately above LaViers, on the Louisville & Nashville R.R., and will build a new town, the work to start at once—as soon as the necessary lumber is on the ground. Building ground is inadequate at LaViers.

Middlesboro—Dr. Samuel Bennett, of Middlesboro, Congressman Caleb Powers, of Barbourville, and others have purchased several thousand acres of coal land in Harlan County on Clover Fork, and propose immediate development.

Wilton—The North Jellico Coal Co., owning two mines here and more than 2000 acres of land, has lent to its employees as much land as each family can cultivate.

Chaviess—The Crevena Coal Co. is constructing 50 miners' houses for its new plant. Following the completion of these, contracts will be awarded for the building of 50 more.

Central City—The Madison Coal Corporation, of Chicago, has purchased the Central mines, of the Central Coal and Iron Co. at this place. The sale includes the mines, together with the mineral rights associated with them, mine machinery, cottages and other buildings. The Central Coal and Iron Co. retains its store and office building and the more pretentious residences and, it is understood, will shortly develop its holdings of 4500 acres adjoining the city and likely also open an operation at Airdale, which is an especially rich deposit. The Central company will maintain its headquarters and sales office at Central City and continue operation of its mines at Echols and McHenry. The Madison Corporation, which is understood to be subsidiary to the Illinois Central, will operate the Central mines, the railroad taking the entire output. Extensive improvements are projected, in mines, mine equipment and buildings and an extended operation of the properties is looked for.

OHIO

Pomeroy—One man was killed and four others badly burned when lightning struck the powder house of the Linden mine, at Nason City, W. Va., opposite this place. It is believed the injured men will all die. The explosion occurred while the five men were in the powder house getting their supply of powder for the day's work.

INDIANA

Terre Haute—Fire causing the loss of thousands of dollars in valuable machinery, resulting, it is believed from a spark from a boiler, destroyed the boiler room of the Speedwell mine, northwest of Terre Haute on Apr. 27. Two electric turbines, a hoisting engine, the boiler and a number of other pieces of machinery, were damaged practically beyond repair. The fire was discovered in the south end of the building by the engineer, and employees attempted to stop the spread of the flames. Later one of the fire-department companies was called from Terre Haute, but the flames were beyond control when the company arrived. This has caused a suspension of all operations at the mine for a short time, but rebuilding operations were started immediately. The company—Richards & Sons—has a number of orders which it may be necessary to place with other companies. According to one of the officials of Richards & Sons, the damage will total \$25,000.

ILLINOIS

Stanton—Collision of a motor with a string of empty cars in Mine No. 14 of the Consolidated Coal Co., Apr. 27, knocked down some of the props and caused a serious cave-in, in which two men were killed and a third seriously injured. The fall was 60 ft. long and it required gangs working from both sides three hours to reach the men. James McGurk, mine boss, and John Crowden, a miner, were killed. The injured man was Ernest Seidel, motorman.

Galatia—The property of the Galatia Coal Co. has been sold to the Saline County Coal Co., of Harrisburg. This makes the fourth mine in the field for this firm. The present workings of the Galatia Coal Co. are in vein No. 6. This coal has never proved a success on the market on account of the quality in this particular section, and the new owners are sinking to the No. 5 bed below, which is the vein generally worked throughout the Saline County field.

Springfield—Hearing of complaints of seventy-five employees of the Chicago & Springfield Coal Co. against the Springfield Consolidated Railway Co. and the Illinois Traction Co., on account of the service to the Devereux mine, two miles north of Springfield, were heard a few days ago by W. R. McCann, of the State Public Utilities Commission. The complaints were against a 10c. fare, insufficient cars and bad roadbed. The explanation of the fare was that the Consolidated company had to pay rental to the Illinois Traction Co. The complaint about insufficient cars was dropped. The commission will have its engineer make an examination of the roadbed.

Four suits were filed in one day recently in the Sangamon County Circuit Court for damages for injuries. Frank Shomidle sued the Sangamon County Mining Co. for \$5000, James Duff and Richard Lazzeri sued the Springfield District Coal Mining Co. for \$1000 each, and John Edwards sued the Madison Coal Co. for \$3000.

Carlinville—A. W. Crawford, who recently closed a deal for a large tract of coal land in this county, has returned from Detroit, where he contracted for the testing of the fields. The largest mines in the world are in this county and it is expected that the workings at Gillespie and Benld will be duplicated in this vicinity.

Foreign News

Petrograd, Russia—At a conference held at the offices of the Minister of Commerce to discuss the question of a government coal monopoly, it was proposed to place all mineral combustibles at the disposal of the government and regularize their distribution. No objection was made by coal representatives at the conference, and it is believed that the scheme will be put into effect about the middle of May.

Personals

George G. McDiffitt, formerly with the Baltimore & Ohio R.R., has accepted a position with the Kiskiminetas Coal Co., with headquarters at Apollo, Penn.

L. L. Holmes, formerly with the Consolidation Coal Co., in its Fairmont plant in West Virginia, has been promoted to chief engineer of the Consolidation in its work at Jenkins, Ky.

R. A. Krueger has been made northern sales agent of the Youghiogheny & Ohio Coal Co., to fill the vacancy caused by the resignation of Max G. Voelkl, to go into the business on his own account.

W. L. Owens has resigned his position with the Fetterman Engineering Co., of Johnstown, Penn., to accept a position with the H. C. Frick Coke Co., at Scottdale, Penn., in the engineering department.

F. L. Stewart has resigned as manager of the Nat's Creek Mining Co., at Richardson, Ky., and will devote all his attention to the Kentucky Gem Coal Co. operation in Carter County, owned by himself and John C. Hatcher.

John Jamison, of Indiana, Penn., who has been in the employ of Dinsmore Brothers for the past several years, has accepted a position with the H. C. Frick Coke Co. in the operating department, with headquarters at Uniontown, Penn.

N. L. Mathews, formerly of Birmingham, Ala., but later connected with the Consolidation Coal Co., at Jenkins, Ky., has accepted a position as mine superintendent for the South East Coal Co. at its plant at LaViers, Ky., on the Kentucky River.

Charles H. Nesbitt, chief mine inspector of Alabama, has been reappointed for a term of three years, and Hugh Lynch was reappointed for a like period as associate mine inspector. The other three members of the board received their commissions some time ago.

A. H. Stokes, yard master of the B. R. & P. Ry. at Cummings, Penn., has been promoted to assistant superintendent of the Middle and Pittsburgh divisions with headquarters at Indiana, Penn., to succeed G. W. Bennett, who has been transferred to DuBois to have charge of special work with the B. R. & P. system.

Edward B. Snyder, Hazelton, Penn., **George W. Leckie**, Tamaqua, and **H. B. Kostenbader**, Mt. Carmel, employees of the Wentz allied companies in this region, have been transferred to the West Virginia holdings of that company, where they will spend a period estimated as three years in opening a new tract of coal land, situated in the Stonega Coal and Coke Co.'s territory.

Knight G. Zoller, general sales agent of the West Kentucky Coal Co., Paducah, Ky., was in Chicago recently arranging for the establishing of a branch sales office. H. L. Richardson has been appointed division sales agent, and will have charge of the territory adjacent to Chicago and the Northwest. Heretofore very little west Kentucky coal has entered this market, but there is no question but that plenty of business will be available.

T. O. Hughes, of Windber, Penn., has returned home after an absence of five weeks at Argentine, Butler County, having electrified the mines of the Argentine Coal Co. The equipment consists of four Sullivan electric mining machines, four Baldwin-Westinghouse mining locomotives, three are 4½ tons for gathering locomotives and a 10-ton locomotive will be placed to handle coal on the main haulage. The power is furnished by a Ridgway engine-driven generator of 200-kw., capacity.

Obituary

James F. Beavers, vice-president and general manager of the Matewan Coal and Coke Co., Matewan, W. Va., was struck and killed by a Norfolk & Western train at Matewan, Apr. 27.

William Fenner, vice-president of the Herzler, Henninger Machine Works of Belleville, Ill., known in every coal-mining state as a maker and installer of coal-mining machinery, died at his home in Belleville recently at the age of 56 years. He is survived by a widow, two brothers and two sisters.

Industrial News

Erie, Penn.—Burke Electric Co., of Erie, Penn., has opened a Washington branch sales office in charge of J. N. Perry, at 424 Union Trust Bldg., exclusively for United States Government service during the war.

Philadelphia, Penn.—Walter S. Smalley, formerly associated with the Mount Hope Coal Co., and now working independently, has moved from the Harrison Building to larger offices in the Commercial Trust Building.

Pittsburgh, Penn.—The United Coal Co. has acquired the properties of the Merchants Coal Co., of Baltimore, at Boswell (Somerset County) for a consideration of about \$2,000,000, including three plants and machinery. The new owners are planning for immediate operation on the lands, and will expend about \$1,000,000 in improvements and extensions and opening up adjacent lands.

Pittston, Penn.—The Pennsylvania Coal Co. has erected a conveyor line at the abandoned Tompkins shaft, in the Oregon section of Pittston City, and is running the culm dump to the Valley tracks, for transportation to a Pennsylvania washery. The Tompkins dump is rich in the smaller sizes of coal, to which no attention was paid in the days when this operation was being mined.

Pittston, Penn.—Mine caving under the tracks of the Delaware & Hudson R.R. at Cork Lane on Apr. 28 wrecked three cars of a freight train and held up traffic for eight hours. The railroad employs six watchmen to guard a mile and a half of track in this cave zone, but the subsidence did not occur until a train was passing over the affected spot. The cave was over workings of the Butler colliery, Hillside Coal and Iron Co.

Springfield, Mass.—The Witherbee Igniter Co. has announced the appointment of E. O. Alston as general sales agent for the "Wico" safety electric mine lamp. The business will be conducted under the name of the Wico Equipment Co. with headquarters at 2138 Oliver Building, Pittsburgh, Penn. The Scranton office in the Coal Exchange Building will be in charge of H. W. Rivenburg as formerly. T. R. Jones will cover the West from Denver and J. J. Ramsey will assist Mr. Alston in Pittsburgh.

Buffalo, N. Y.—The Shawmut Coal and Coke Co. is opening a new mine in its Byrnedale district, south of the St. Marys headquarters, with prospect of 500 tons a day by fall and 1000 tons early next year. It has completed all of its low-priced contracts and now proposes to sell almost entirely in the open market. The coal is lower Kittanning and though rather too thin for mining at a profit at the former low prices, there should be a good profit in it now. The company already has three mine openings in the district.

Norristown, Penn.—At Yerkes Station, on the Perkiomen branch of the P. & R. Ry., a freight train traveling at the rate of 40 miles an hour crashed into an open switch of the coal yard of Landes Bros. One trainman was instantly killed and the coal yard destroyed by fire. Some of the cars contained war munitions. Two of these loaded with dynamite caught fire and were partly consumed, but fortunately the blaze was extinguished. It is believed that the switch was opened with the intention of causing the destruction of the train.

Columbus, Ohio—C. P. Torrey, superintendent of car service of the Hocking Valley Railway Co., issued orders last week prohibiting the moving of any coal-carrying equipment off the lines of the company. Producers and shippers generally arose in arms and the opposition was so strong the order was withdrawn and the regulations remain unchanged. Operators and shippers having contracts to supply fuel off the lines of the Hocking Valley would have been unable to fulfill the contract in case the drastic regulations had been allowed to stand.

Scranton, Penn.—Negligent and reckless mining, done several years ago in the Diamond, Rock, Big, New County and Clark veins was found to be the cause of the sinking that resulted in the death of Thomas Evans by asphyxiation from illuminating gas on Feb. 18 last. The May Grand Jury, which has been making an inquiry, in its report to the court, says: "But as this negligent and reckless mining was done several years ago, the statute of limitation bars the indictment for involuntary manslaughter of those responsible for said criminal negligence."

Cincinnati, Ohio—A meeting of large consumers of coal was held a few days ago under the auspices of the Building Owners and Managers' Association, in order to discuss measures for meeting the coal situation. General Superintendent Brent Arnold, of the Louisville & Nashville Railroad Co., was one of the speakers, pointing out that better storage facilities are needed at Cincinnati to make a shortage of fuel less probable, and that some measures to prevent the cars of initial lines from being held in the North are necessary. The Federal Government will be urged to facilitate the movement of coal by river to help out the situation.

Terre Haute, Ind.—The Northern Indiana Gas and Electric Co., which supplies power and light for Hammond and surrounding cities and power to a number of the largest munition factories in this section of the country, filed a petition for an injunction against the Martin-Higgins Coal Co., the W. S. Bogle Coal Co. and others in the circuit court recently. Owing to the vacation of the court, the injunction plea has not been heard. The petition sets forth that the company supplies light and power to a number of northern Indiana cities and power for the operation of the American Steel Foundry, the Edwards Valve Co., the Standard Steel Forging Co., the Green Engineering Co. and the Aetna Explosive Co., all of the plants of which have munition contracts with the United States government, and that the government has stationed a number of guards about the plant. The Gas company, according to the petition, has an annual contract with the Higgins-Martin Coal Co. for 25 carloads of coal a week. The Higgins-Martin Co. repudiated the contract and is threatening to sell its Pine Ridge mine to the W. S. Bogle Co., thus incapacitating itself from being able to supply the coal to the Gas company, according to the complaint. The Northern Indiana Gas and Electric Co. through its attorneys is asking an injunction to prevent breach of contract and to enjoin the sale of the mine, and alleges that present extraordinary conditions of the coal market and necessity of having coal to make power for munition plants, make it necessary to secure the coal under contract.

Market Department

GENERAL REVIEW

Heavy buying of anthracite and situation very tense. Inability of railroads to meet the demand for heavier shipments of bituminous causing widespread anxiety. Steadily tightening market at this season of the year has completely upset the trade. Orders exceeding all expectations in the Middle West. Particularly urgent demand from the Northwest.

Anthracite—Never before in the history of the anthracite trade has such a chaotic condition prevailed. The public has been thoroughly aroused as to the possibilities of the situation and enormous tonnages have been negotiated without either buyers or sellers fixing prices. The delay in the announcement of the May prices and the final very sharp increase in same had no influence on orders and practically the entire output for the current month is already covered. Urgent telegrams requesting coal are becoming so common in the offices of the leading agencies that they are being ignored. Another result of the strained situation is seen in the tightening and closer scrutiny of credits; it is well known that a great many retailers have obligated themselves for low-priced coal, which they will be unable to furnish, and some of the big companies are now automatically cutting off shipments where bills are not met promptly on the date due. Embargoes of various descriptions have cut off certain sections of northern New England from any shipments of domestic sizes at all. The coastwise freight situation still looms up as a dominating factor.

Bituminous—The market is very erratic, with demand heavy, though buyers willing to meet the ruling high figures are usually able to obtain their requirements. The railroads are buying heavily and even confiscating coal, while there are considerable tonnages going to the West and to New England points which is tending to limit the supplies available in other markets. The constantly increasing scarcity of labor, together with the obvious inability of the railroads to increase shipments, is causing widespread anxiety throughout the industry. The request of the Government for the preferential movement of coal is having no apparent effect. Some miners are also enlisting in the service, but, with the selective draft program now in effect, the coal industry will likely be exempted, and, in addition to this, there will probably be miners who have gone into other lines will now return to the mines in order to get the benefit by this provision. The announcement that the Government will not interfere with coastwise shipping, for the time being at least, has occasioned great relief at Down East points.

Lake Trade—The heavy buying in the Pittsburgh district noted last week has continued with the result that spot prices are again up, and with car supply only moderate, it is difficult to see how the Lake movement can equal requirements. The almost unprecedented situation of a steadily advancing market in April has completely upset the trade. There has scarcely been sufficient car supply to meet contract obligations with the result that the available supply of free coal has been still further limited. Unless there is a substantial and immediate increase in the car supply, it is difficult to say where the top of the market will be. The situation is entirely in the hands of the sellers and quotations are already crowding the maximum level attained last winter. Contrary to the usual custom, both steam and domestic consumers are aggressively in the market for storage supplies.

Middle West—The situation hinges entirely on transportation facilities, which are hopelessly inadequate and becoming steadily more so as the season advances. In the meantime, orders are exceeding all expectations, while incipient strikes and labor difficulties are becoming more general and tending to still further limit the production. One encouraging feature is the fact that the retail dealers are fully awake to the possibilities of the situation and are accumulating all the reserves possible. Weekly orders in some districts are occasionally double the productive capacity of the mines and buyers of all kinds are aggressively in the market. Last week there was an unexpected influx of railroad orders from the Northwest for delivery over the next 90 days at prices double those of a year ago.

A Year Ago—Anthracite wage agreement causes a sharp reaction. Bituminous also weaker. Lake trade fails to absorb the expected tonnage. Labor shortage a dominating factor in the situation. Urgent demand for screenings in the Middle West, but market otherwise quiet.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

	Year Ago	May 5	Apr. 28	Apr. 21	Gross Averages
Boston					
Clearfields.....	*\$1.35@1.75	\$4.75@5.50	\$4.50@4.75	\$4.75@5.50	Dec. 23 4.67@5.08
Cambrias and Somersets.....	*1.75@2.05	5.00@5.75	4.75@5.50	5.15@5.75	Dec. 30 4.73@5.19
Pocah. and New River ¹	*2.80@2.85	6.00@6.25	5.50@5.75	6.00@6.50	1917
Philadelphia					
Georges Creek (Big Vein)....	1.90@2.00	5.25@5.50	5.00@5.25	5.00@5.25	Jan. 6 5.16@5.53
W. Va. Freeport.....	1.20@1.30	4.25@4.50	4.25@4.50	4.25@4.50	Jan. 13 4.74@5.11
Fairmont Gas mine-run.....	1.35@1.45	4.25@4.50	4.25@4.50	4.25@4.50	Jan. 20 4.54@4.98
Pittsburgh (steam coal) ²					Jan. 27 4.64@5.03
Mine-run.....	1.20@1.30	3.75@4.00	3.25@3.50	3.25@3.50	Feb. 3 4.66@4.86
4-in.....	1.30@1.40	3.75@4.00	3.25@3.50	3.25@3.50	Feb. 10 4.70@4.95
Slack.....	*1.00@1.10	3.50@3.75	3.25@3.50	3.25@3.50	Feb. 17 4.67@5.04
Chicago (Williamson and Franklin Co.) ³					Feb. 24 4.95@5.29
Lump.....	1.35@1.45	3.00@3.25	3.00@3.25	3.00@3.25	Mar. 3 5.10@5.48
Mine-run.....	1.20@1.30	2.50@2.75	2.50@2.75	2.50@3.00	Mar. 10 5.36@5.61
Screenings.....	†1.00@1.10	2.50@3.00	2.25@2.75	2.50@2.75	Mar. 17 4.80@5.19
Gross average ³	*\$1.45@1.59	\$4.04@4.40	\$3.81@4.12	\$3.83@4.14	Mar. 24 4.64@4.94

¹ F. o. b. Norfolk and Newport News. ² Per net ton. ³ The highest average price made last year was \$4.80@5.33 made on Nov. 25. * Price lower than the week before. † Price higher than the previous week.

BUSINESS OPINIONS

Iron Age—At the meeting of the steel manufacturers on Apr. 26 to arrange for apportioning Governmental orders for war purposes it came out that 610,000 tons of plates, shapes and bars would be required for schedules already made up, while in all forms of steel the year's requirements are put at 1,100,000 tons. At the 2.90c. price for plates and 2.50c. for shapes and bars some of the smaller manufacturers, buying raw material at market prices, could scarcely come out even.

The steel trade has noted with great interest the intimations from informed sources that the Government in its next purchases of copper will pay substantially the market price, instead of exacting the sweeping concessions recently made. The decision is highly significant. Wages based on sliding scale agreements are involved, as is also the prosperity of industries which it is proposed to tax heavily for war purposes.

Bradstreet—Notwithstanding some irregularities, trade and industrial currents continue to indicate unwonted activity, to cope with which existing facilities are entirely inadequate. War expenditures stimulate, and, indeed, more could be done if the means for getting goods shipped or delivered were available. With the opening of navigation considerable relief will be afforded to severely overtaxed railway facilities. Recognition of the high cost of living has resulted this week in advances for 400,000 coal-mine workers, and in numerous other lines higher wages are to go into effect May 1. A sifting of the facts as regards distribution shows that while recessions have occurred in some branches of jobbing and retail trade, notably in wearing apparel and kindred lines, losses have been pretty well balanced by heavy Government purchases of army equipment at wholesale and by somewhat hysterical purchasing of foodstuffs, born of fear of immediate rather than of future scarcity.

Dun—Except for Government requirements, general business is of lessened magnitude, and conservatism is a more conspicuous feature in many quarters. The restricting influence of the high and steadily rising prices is clearly seen in the growing tendency toward economy and retrenchment among consumers, and, as a reflection of this, manufacturing activity is in some branches subsiding. Commercial failures this week are 283, against 268 last week, 251 the preceding week and 336 the corresponding week last year.

Dry Goods Economist—In some lines complaint is heard as to retailers' unwillingness to operate. In others, sellers show no anxiety, for the simple reason that they are sold up far ahead or in view of the difficulty of forecasting the future are unwilling to accept orders. We need hardly say that the latter class are principally the mills making cottons, silks and wool and worsted dress goods. In the former class are manufacturers of merchandise which is bought closer to the time of distribution, such as women's garments, neckwear, millinery, etc.

Marshall Field & Co.—Wholesale shipments of dry goods for the current week have been much in excess of the heavy volume in the corresponding period of a year ago. Road sales are running considerably ahead of the same week last year for both immediate and future deliveries. Merchants have been in to market in fewer numbers. Collections are larger.

CONTRACT PRICES

New York—Of the 195,288 tons of coal asked for by the Central Purchase Committee for 14 departments, bids were received Apr. 26 for 118,452 tons. Two bids were submitted for furnishing and delivering 1626 tons of egg coal at \$13.60 and \$14.20 per ton. The same bidders offered to supply 3084 tons of pea coal at \$11.70 and \$12.30 per ton respectively. For furnishing 1325 tons of buckwheat No. 1 bids ranging from \$10.95 to \$11.90 were received. Other bids received for furnishing domestic coals ran as high as \$14.75 per ton. For water front deliveries a proposal of 1100 tons of stove coal brought a bid of \$11.85 per ton. There were two bids received for supplying 16,150 tons of buckwheat No. 3, of \$4.95 and \$8.20 respectively, while one bid of \$8.45 per ton was received for furnishing another lot of 20,500 tons of the same sized coal. Bids for furnishing two lots of mine-run, 4000 and 19,700 tons respectively, brought offers of \$7.55 and \$9.35 for the smaller tonnage and \$7.48 and \$8.60 for the larger amount. The contract, if granted, extends over 11 months beginning May 1.

Cleveland—On the request for bids for furnishing 12,000 tons of mine-run coal for the city garbage plant during the year beginning June 1, only one reply was received. This was from the Valley Camp Coal Co., and the price quoted was \$7.25 per net ton, f.o.b. Cleveland. It is likely the figure will be accepted.

Columbus—The contract for furnishing the city with Hocking nut, pea, and slack coal for the current month has been awarded to the Geo. M. Jones Coal Co., at \$4.60, f.o.b. tracks at the various city departments. The bid of \$5.75 per ton for Hocking lump has been refused, and purchases will be made in the open market. These were the only two bids received. In the future purchases will be made from month to month instead of over six-month periods, as is customary.

St. Louis—A few short-term contracts for railroad fuel have been made at \$2 for Standard steam lump running until the first and middle of July, and a few mine-run contracts at \$1.75 for short terms. A few agreements have been effected providing for the delivery of certain tonnages at average prices in effect at time of shipment. It is generally impossible to get quotations of any kind beyond July.

Atlantic Seaboard

BOSTON

Apprehension somewhat relieved by decision of shipping board. Hampton Roads prices firmer. Demand strong for Pennsylvania grades. Anthracite coming forward very slowly, and new high prices quoted in open market. Company circular advanced 25c. over expected May basis.

Bituminous—Anxiety here was somewhat eased by the decision of the National Defense and Shipping Boards not to take coal steamers or tugs from the coastwise trade. This leaves water traffic without further disturbance for the moment, although rules with regard to entering and leaving the harbor are making the movements lower, and it is understood that still fur-

ther regulations as to the length of tows or the number of barges in a tow are also in prospect. The market is certainly beset with uncertainty and shippers make their plans only for a few weeks at a time.

Though car-supply continues short, the movement to Tidewater is somewhat better than a week ago. Dispatch is excellent at the piers and as fast as the movement of boats will permit contract requirements are being met with reasonable promptness. With many buyers the difficulty is they did not buy enough while the agencies were in a selling mood. A slightly larger volume of coal is being exported, although the increase is over a month or two ago rather than a year ago. Spot prices are firmer, although price fluctuations are mostly sentimental, no shipper having any considerable quantity of surplus coal for prompt dumping. On the other hand, inquiry from this territory is very light, the high level of water freights being the chief reason. In proportion, factors in this market are also making better deliveries on contract than a month ago, and then again the amount of fuel consumed is decreasing a little with the advance of the season.

For scattered cargoes, however, and for small lots inland from Tidewater plants there is a fairly steady demand at the high prices that prevail. Several sales have been made at \$11 along-side, Boston, and \$11.25@11.50 on cars. East of Boston, as at Portland and Bangor, there is a dearth of Pocahontas and New River for sale, even in small quantities. The current market there is dependent upon Pennsylvania coals, almost exclusively this season, and the effort is being made to put a large proportion of the latter through all-rail on account of the advantage in rates.

The Boston retailers advanced the price of bituminous on May 1 from \$9 to \$10 per ton of 2000 lb., delivered, effective until further notice.

A few public contracts are soon coming into the market but the authorities who solicit are unlikely to have any better success getting prices for later deliveries than did the City of Boston a fortnight ago. It is impossible for the dealers themselves to know what coal is to cost them, even in the near future, there are so many possibilities in the situation.

Prices on the Pennsylvania steam grades are noticeably firmer, and \$6 coal is again freely predicted. A very large tonnage for New England comes via the N. Y. C. R.R. and now that the embargo referred to a week ago has been extended "until further notice," in order to clear up congestion, there has resulted a sharper demand for the coals on which there is a routing open. Factors are selling on car numbers, and even a very ordinary coal under these conditions will command up to \$5.50, f.o.b. mines.

An embargo against some of the Tidewater loading ports has also been effective the past week on account of accumulations. The effort is so great to secure anthracite-carrying barges to move bituminous that shippers find themselves with heavy demurrage accruing while they wait their turn for barges. There is steady call here for cargoes of this kind, prices being based as they are upon freights well below the current market, and today there is practically no limit to the number that could be placed if the barges were forthcoming.

Bituminous at wholesale, is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. and Somersets
Philadelphia.....	\$6.00@6.50	\$6.25@6.75
New York.....	6.25@6.75	6.50@7.00
F. o. b. mines.....	4.75@5.50	5.00@5.75
Alongside Boston (water coal).....	10.00@10.25	10.25@10.50

Pocahontas and New River are quoted at \$6 @6.25, f.o.b. Norfolk and Newport News, Va., for spot coal, and \$11.25@11.50 on cars Boston or Providence for inland delivery.

Anthracite—The situation goes from bad to worse. Alarming reports come from the mining regions concerning the shortage of labor, and shipments certainly are very light. Only about four companies are making deliveries in their own barges with any regularity whatever, and receipts even from these sources are extremely meagre. With an embargo against two of the three transfer points and water coal so absolutely scarce that none of the distributors will sell for delivery inland, a large part of Northern New England finds itself unable to get domestic sizes.

The recent advance granted the anthracite mine-workers farshortened an increase in the companies' circular prices. One agency has announced the May price as 35c. up from the April schedule, but at this writing other announcements have not been made.

At retail, for steam purposes, anthracite screenings have been advanced from \$4 to \$6 per ton of 2000 lb.

"Independent" coal has been quoted this week as high as \$7 for stove, f.o.b. mines.

There is an intimation that further advances in anthracite barge rates are soon to take effect. For one large company in the trade this would be the first advance of the kind in more than 20 years.

NEW YORK

Anthracite operators advance circular prices. No relief in sight. Stocks reduced to a minimum and workers continue to leave the mines. Steam coals scarce. Bituminous market stronger. Demand heavy but production is slow. Car supply better and shipments improve.

Anthracite—Demand keeps up while Tidewater stocks are far below normal with no immediate relief in sight. For several weeks most of the large companies have been refusing orders.

Contrary to expectations only one of the selling companies announced a new schedule of prices for May as a result of the increase in wages granted the anthracite mine workers last week. This company announced that beginning May 1 there would be an advance of 25c. in the Tidewater price for broken, egg, stove, nut and pea coal, and in addition the usual monthly increase of 10c. per ton would be added, making the prices 35c. above the opening April schedule, and making the f.o.b. prices for this company's coal at the lower ports: Broken, \$5.30; egg, \$5.30; stove, \$5.55; pea, \$5.60; nut and buckwheat, \$4.15.

There are plenty of inquiries but buyers hesitate at the quotations. A feeling of uncertainty exists and many tradesmen expect lower prices shortly. The companies are holding to their regular schedule of prices, but have no coal to offer as they are hardly able to take care of their regular customers. On the other hand, quotations for the individual product are high.

Receipts of coal at the New York Tidewater are far below the demand. Most of the coal mined is being sent to New England and the West, shipments to the Lakes being particularly heavy. Line prices for individual coals are on a higher basis than at Tidewater.

The increased wages given the mine workers last week may prove an incentive for heavier production but this is doubtful. Reports early this week show that many men are leaving the regions for other employment and one individual operator said that in one day the later part of last week 15 men left his employ.

Chestnut coal was in larger supply than either stove or egg. For the latter size one shipper said he believed \$9 f.o.b. could have been obtained if a cargo could have been made up. Fresh mined chestnut and stove were much easier, while washery chestnut brought a lower quotation.

The steam producing coals are scarce. Many of the hotels and office buildings are running close and their owners are scouring the market without much success.

Retail dealers are worried over the outlook. They do not feel able to pay the high prices asked for individual coals and the companies are not in a position to ship them all the coal needed. They are slow in placing orders, hoping to see a break in the prices soon.

Not much interest was taken in the opening of the bids for 195,288 tons of coal for various city departments, last week. The prices submitted for prepared coals ranged from \$13.60 to \$14.75 per ton; \$11.70 to \$12.55 for pea and from \$9.45 to \$11.90 for the buckwheat coals.

Reports show that in March, 13,720 tons of hard coal were exported from this port, as against 8,231 tons in the corresponding month of last year.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports, are as follows:

	Circular	Individual
Broken.....	\$5.30	
Egg.....	5.30	\$8.00@8.25
Stove.....	5.55	8.00@8.25
Nut.....	5.60	8.00@8.25
Pea.....	3.60@4.10	6.50@6.75
Buck.....	3.70@3.80	6.00@5.25
Rice.....	3.00@3.30	5.00@5.25
Barley.....	2.50@2.80	3.00@3.50
Boiler.....	2.20	

Quotations for domestic coals at the upper ports are generally 5c. higher, on account of the difference in freight rates.

Bituminous—Demand continues heavy though buyers willing to pay the prices asked are able to satisfy their wants. High-grade coals are quickly absorbed but the fair grades are more in evidence than in the past few weeks.

Car supply shows improvement with prospects of quicker shipments as a result of orders to give preference to coal and iron ore. Production lags, however, and the miners in the Central Pennsylvania fields have neglected their work pending the outcome of the conferences between their representatives and the operators. This meeting came to an agreement after a discussion lasting more than two weeks. There are some petty labor troubles at individual mines, but these are being settled up. Labor shortage is growing and this is worrying the operators more than anything else at this time.

The railroads are buying freely and in some instances are confiscating coal. Considerable coal is being sent to Western points via the Lakes, all of which causes shorter Tidewater stocks. New England is also buying heavily, notwithstanding the strong boat rates.

Information concerning exports is meagre, but reports show that during last March 3221 tons of coal were exported from this port as compared with 2193 in March of 1916.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades, are as follows:

	Port Reading	South Amboy	Mine Price
George Crk.			
Big Vein..	\$6.75@7.00	\$6.75@7.00	\$5.50@5.75
Tyson...	6.50@6.75	6.50@6.75	5.25@5.50
Clearfield..	6.25@6.75	6.25@6.75	5.00@5.50
South Frk...		6.50@6.75	5.25@5.50
Nanty Glo...		6.50@6.75	5.25@5.50
Som'r. Co...	6.25@6.50	6.25@6.50	5.00@5.25
Que'ho'ing..	6.50@6.75	6.50@6.75	5.25@5.50
W. V. Fairm't			
Th'r'qua...	6.25@6.50	6.25@6.50	4.50@4.75
Mine-run....	6.25@6.50	6.25@6.50	4.50@4.75
West. Md...	6.00@6.25	6.00@6.25	4.50@4.75

PHILADELPHIA

Anthracite badly unsettled as anxiety for coal grows. Labor situation serious. New England demand absorbs heavy tonnages. Tightening credit conditions. Bituminous prices fluctuate erratically. Heavy railroad confiscation upsets trade and local strikes cut production. Car shortage and embargoes hold back shipments.

Anthracite—Never in the history of the trade have such unsatisfactory conditions prevailed. Thousands of orders have been booked without either the buyer or seller knowing the price. When the retailers found that the prices for May would advance more than the usual 10c. they refused to accept any more business at the April rate. The public being thoroughly aroused continued to buy coal, although the dealers would not quote a price; they simply took the orders for May delivery, and some even extended the delivery to June, while others still more cautious refused to specify either delivery time or price.

The dealers have also been placing May orders in such volume that it is only a question of a short time before the shipper will be compelled to refuse further business. The fact that the announcement of the new May prices was so long delayed made no difference whatever. The production for the month of May was practically all sold subject to prices to be decided upon later.

The stocks in the dealers' yards are at very low ebb, due to the continuance of cool weather, which has necessitated the maintaining of all fires by the householders. In addition the public is growing more anxious each day about next winter's supply. The larger dealers already have enough orders on their books to keep their equipment busy until hot weather.

There is no doubt that the production as compared with the demand will be light, due to the shortage of labor. If some influence is not brought to bear upon the men to increase the number of working hours, the situation will be alarming by fall. Labor in particular continues to flock to Bethlehem, where there are now over 70,000 men on the payroll of the steel company. The smaller operators are paying higher wages, but the past few weeks found many young men enlisting for the war, which is another cause for worry.

It is very probable that the severe criticisms of the press and public, together with the possibility of more investigations, has caused some sober second thoughts as to prices. There are shippers who are prepared to show that the average cost of mining is close to \$1.80 per ton. An increase of 20 per cent. in the miners' wages, which was made effective as of May 1, will undoubtedly be an added expense of about 35c. per ton, which under existing conditions is only reasonable to suppose will be passed on to the dealer and thence to the consumer.

This applies to the big companies, because the individuals continue to disregard precedent and ignore this market. There are some exceptions to be sure, but their tonnage to this city is light and they have had no trouble in disposing of the family sizes at winter circular and around \$3.50 on pea coal. In fact, the last week in April found them billing coal to outside points at from \$6 to \$6.25 for egg, stove and chestnut, with pea coal running from \$4 to \$4.75.

There is no doubt that the panic among the consumers in New England is the cause of diverting most of the coal from this territory. Even the smaller of the individuals receive as many as ten long-distance phone calls a day from that territory requesting shipments at premium prices. Telegrams from there settling the price and asking for a definite number of cars of coal are so common as to make it almost impossible to answer them and they are ignored in most instances.

One individual operator, marketing a very high-grade coal, especially well prepared, has announced his May prices as follows: Egg, stove, chestnut, \$5.10, and pea, \$4.50 at mines, and we have not the least doubt that his May production will bring these figures.

When the retail men withdrew their April prices after having been flooded with orders which they were absolutely unable to fill, a new cry was started for an investigation. The

movement has been led by the men who pressed the freight-rate reduction to a successful conclusion against the railroads, and the matter has been called to the attention of the Federal Trade Commission who announce that they will conduct an inquiry.

The dealers have so many troubles of their own that they do not pay any attention to this latest move, as their chief desire for the moment is to get sufficient coal to at least make expenses. The shipping companies are cognizant of the heavy tonnages which the dealers have obligated themselves to deliver to their customers at the April prices and are much concerned as to the effect it may have on their financial condition. The shippers are now insisting more strongly than ever on prompt payment of all bills and we know that it has been narrowed so closely by some companies that shipments stop automatically when settlement for coal delivered the previous month is not made promptly by the twentieth of the month.

Another difficulty of the retailers is the increasing number of carload shipments to parties who are using influence to have direct shipments made and distributing the coal among their friends. Due to the extraordinary demand influential people are exerting every effort to get coal and while in ordinary times the retail men are willing to overlook an occasional shipment, they claim that it is seriously affecting them now. This is particularly true in the suburban districts where the homes of the big businessmen of the city are located. It is claimed that in one particular section during the past week 25 cars of coal were so received.

In the contracting there has been some change on the part of one of the big companies, as was to be expected. It is understood now that this company is making contracts with all of its old customers and a few new ones on rice coal at the price of \$2.50, the same as during April for current shipments. They have also closed agreements with heavy users of buckwheat whom they previously served, which price has been fixed at \$2.50. It is understood that a clause has been inserted in all contracts in which the shippers cover themselves in the case of an increase of wages being granted to the miners or of any tax that might be levied either by the national or state governments.

The Lehigh Valley Coal Sales Co. was the first one of the large producing companies to announce their May prices. There was great interest in the new circular as it was expected that since the miners had been granted an increase of 20 per cent. in their wages this would naturally be reflected in the new price circular. The amount of the increase in the new circular as issued by this company has been fixed at 25c. per ton. The company also continues the usual practice of reducing the discount 10c. a ton per month, so that the prices quoted by them for May are actually 35c. higher than the April prices. The new prices are as follows: Egg, \$4; stove, \$4.25; nut, \$4.35; pea, \$2.85.

The local prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows

Line	Tide	Line	Tide
Broken....	\$4.50 \$5.65	Buck.....	\$2.50 \$3.40
Egg.....	3.65 4.75	Rice.....	2.00 3.00
Stove.....	3.90 5.10	Boiler.....	1.80 2.90
Nut.....	4.00 5.05	Barley.....	1.50 1.75
Pea.....	2.80 3.70		

Bituminous—The trade has been very unsettled, with price fluctuations frequently, and it has been very difficult to keep track of the rapid changes. Early in the week prices took a sudden upward turn, only to react 48 hours, later, followed again by another upturn. Supplies of spot coal, as well as shipments on regular orders, have been slow in reaching the city, due principally to the railroads confiscating large tonnages recently. This has upset both shippers and consignees as they were unable to tell from day to day just what to expect in the way of receipts, even though they knew that shipments had been made. It is reported that the railroads had determined to stock a certain tonnage by May 1 and having accomplished this now, some relief may be in sight. Shipments to the local market have also been affected to some degree by the opening of Lake navigation about the middle of last month.

It is also reported that local strikes in various sections of the mining regions shipping to this territory have had a share in the decreased production. The car supply also fails to show any improvement, and there are numerous embargoes by the railroad companies at various points on account of general freight congestion. There is no activity whatever in bituminous contracting, as most shippers consistently refuse to take on any more business of this kind. Inquiries from consumers are almost as frequent as ever.

The prices given herewith show very little change over those of a week ago, although a few of the better grades are about 25c. higher. Of course there is the usual low-grade coal to be had around \$3.75, but which we do not record.

Prices per gross ton, f.o.b. cars at mines, are as follows:

Georges Creek Big Vein.....	\$5.25@5.56
South Fork Miller Vein.....	5.00@5.25
Clearfield (ordinary).....	4.75@5.00
Somerset (ordinary).....	4.75@5.00
West Va. Freeport.....	4.25@4.50
Fairmont gas lump.....	4.50@4.75
Fairmont gas, mine-run.....	4.25@4.50
Fairmont gas, slack.....	4.00@4.25
Fairmont lump, ordinary.....	4.25@4.50
Fairmont mine-run.....	4.00@4.25
Fairmont slack.....	4.00@4.25

BALTIMORE

Despite government order for coal right of way, movement is moderate, as mine production is light. Prices still stiffen. Anthracite sold here at winter schedule.

Bituminous—The railroads are making every effort to meet the government request for preferential movement for coal and other articles of immediate need in the present national crisis, but the fuel movement to this point continues relatively light. From mining sections there are reports that the trouble is not now so much lack of rolling stock as it is of inability to get miners. While the mining business will probably come under the exemption clause in the selective draft, there will undoubtedly be losses through volunteers as soon as over-the-seas service is assured. These ranks of course may be filled by men who take up mining in order to obtain exemption and may include a number of experienced miners who recently have gone into other lines. It will require a year of shake-down under war conditions before the results can be ascertained. Meanwhile prices both at the mines for future delivery and on spot coal have stiffened again.

Prices to the trade at the mines are about as follows: Georges Creek Tyson, \$5@5.25; Somerset, \$5; Quemahoning, \$5; Clearfield, \$4.75; Freeport, \$4.50; Fairmont gas, three-quarter, \$4.25; run-of-mine, \$4; slack, same, \$4.

Anthracite—Hard coal is still selling here at winter prices. There will probably be another meeting of retail interests here within a few days to definitely settle on a schedule. No one is looking for a drop, as there is practically no cut-price coal for spring coming through. Sales for the most part are strictly on a basis of winter prices, plus the advanced rates on for pea, broken and No. 1 hard. The amount of orders coming in to the coal men now, at winter schedule is a surprise to many. There was a brief lull when it was learned that the local coal men did not make the usual fifty cent cut for April, but now orders are coming in and deliveries made, apparently under the spur of the fear that the war will cause still further advances.

HAMPTON ROADS

Prices stiffening. Free coal practically unknown. Labor at piers still unsettled. Heavy movement both foreign and coastwise.

As indicated last week, spot prices have advanced at least 50c. to \$1 per ton. This is due to inquiries for future delivery and the acute shortage existing at Hampton Roads for the past week. It is now very difficult to secure any free coal and there is no immediate change in sight at present.

Under the circumstances vessels are receiving fair dispatch, though there are instances of serious delays. The trimmers and railways have not yet settled their differences and on one day at Newport News the men refused to work. Work is now going on under a temporary arrangement and it is understood that the railways will meet, to a certain extent, the demands of the trimmers. Coastwise and foreign shipments are very heavy, though definite information regarding the export movement is not available. A noteworthy feature is the increasing volume of high volatile coal moving coastwise.

Prices for coastwise and foreign shipment for New River and Pocahontas run-of-mine are \$6.50@7 per gross ton, for bunker delivery around \$7, plus 15c. trimming, for local delivery, \$5.50@6 on track. Anthracite \$9 per net ton, delivered. High volatile coals are quoted around \$4.50 per gross ton.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Apr. 7	Apr. 14	Apr. 21	Apr. 28
Nor. & West....	174,420	119,340	142,018	88,577
Ches. & Ohio....	112,128	106,188	120,257	126,533
Virginian.....	80,457	66,383	99,249	116,468
Total.....	367,005	291,911	361,524	331,578

Ocean Shipping

OCEAN FREIGHTS

It is becoming more and more difficult each day to secure steamers for export coal, owing to the great scarcity of tonnage. The only recent fixture worthy of comment was the charter of the Spanish steamer "Otoyo," about 4500 tons coal capacity, immediate loading, Virginia to Buenos

Aires, at \$28.20 per ton, all freight in advance. Any changes in the market since our report of a week ago, are towards a higher level, in some instances, as noted below.

We would quote freight rates on coal by steamer as follows:

Europe	Apr. 23	Apr. 30
West Coast Italy	\$75.00 about	\$75.00@100.00
Marseilles.....	75.00 about	75.00@100.00
Spain (Atlantic)*	30.00 about	30.00@36.00
Spain (Med't'n)*	32.40 about	32.40@38.40

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

South America		
Montevideo....	\$28.80 about	\$28.20 about
Buenos Aires....	28.80 about	28.20 about
Rosario.....	30.00 about	30.00 about
Rio Janeiro.....	\$25.00@28.00	\$25.00@27.00
Santos.....	\$28.00@30.00	\$28.00@30.00
Chile (good port)	17.00@18.00	17.00@18.00

West Indies		
Havana.....	5.50@6.00	6.00 about
Cardenas, Sagua	7.00 about	7.00 about
Cienfuegos....	8.00 about	8.00 about
Port au Spain...	10.00 about	10.00 about
St. Lucia.....	10.00 about	10.00 about
St. Thomas....	8.00@9.00	8.50@9.00
Barbados.....	10.00 about	10.00 about
Kingston.....	7.25@7.50	7.25@7.50
Curacao.....	9.50 about	9.50 about
Santiago.....	8.00@8.25	8.00@8.25
Guantanamo....	8.00@8.25	8.00@8.25
Bermuda.....	6.50 about	6.00@7.00

Mexico		
Vera Cruz.....	9.00@10.00	9.00@10.00
Tampico.....	9.00@10.00	9.00@10.00

* Spanish dues for account of cargo. * And p.c. * Or other good Spanish port. * Net.

W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

A 1500-ton barge was chartered this week from Hampton Roads to Portland at \$5.25, this being the record quotation thus far. A few days earlier a 3000-ton barge was secured for \$4.75, same loading for Boston.

New York rates to Boston are \$3, and to Providence \$2.25@2.50; \$4 continues the quotation on schooners for points on the Penobscot, but coal is in such short supply that inquiry is not very brisk.

Lake Markets

PITTSBURGH

Spot market up 50c. on account of heavy buying. Lake movement will probably be inadequate.

The buying of spot coal by the Pennsylvania Railroad, noted a week ago as having served to avert a decline in the market, has continued and a large tonnage has been taken. From this or other causes the spot market for steam coal is up 50c. and gas coal is 25@50c. higher. Car supplies are only moderate and it is hard to see now the Lake coal movement can be equal to the demand. Small shipments have been made for three weeks past, and some coal has been loaded into vessel but at this writing no vessels have left for the head of the Lakes.

Prices for Lake coal have not been established but probably will be within a fortnight. Much coal has been put under contract subject to the price being fixed later as the market develops. There is hardly any contracting with consumers for the twelvemonth, both buyers and sellers being reserved.

We quote spot coal at \$3.50@3.75 for slack, \$3.75@4 for steam mine-run and \$4@4.50 for 1/4-in. gas, per net ton at mine, Pittsburgh, district, and contract largely nominal at \$3.50@4.

BUFFALO

Bituminous advancing. Cars so uncertain that prices are very erratic. Men are working indifferently and some are waiting for wage advances. Anthracite consumers anxious. Supply small.

Bituminous—The unsteadiness in prices continues. While the demand is mostly light, the consumer is anxious, for the usual decline in prices at this time of the year have not taken place. The spectacle of an advance in April is new or at least not looked for and it leaves the consumer at sea. He finds the seller still more averse to contracting than formerly and he now fears that he is going to get left unless he gets a good part of his supply in that way.

The car situation is not improving. As a rule the jobber complains more than ever that he can sell nothing with a certainty that it will reach destination before the buyer has to look elsewhere for a supply. The relief expected from the railroads when winter was over has not yet arrived and it is not now looked for. All that a shipper can do is to watch his shipments and make it uncomfortable for the railroad official who has the cars in charge.

It will be some time before the miners again work as they should. They often make trouble

by refusing to work on some plea, mostly because their demand for more wages has not been agreed to. Some districts have paid the advance demanded, but others are hesitating. They do not deny that the men are entitled to more pay, but if coal goes down there will be no way of returning wages to the former basis.

The contract situation has stiffened very materially of late. In fact, there is next to nothing in that line going on the books. Shippers are afraid to make any figures, lest they come out as they did last year. The plan now is to refrain from bidding on public contracts and asking prohibitive prices to private consumers. A few weeks ago a contract could be made at \$3, mine price per net ton, but the asking price now is above \$4, sometimes going to \$4.75, which the consumer will not usually pay.

The scale for spot bituminous prices is more and more irregular as the difficulty of shipment increases. A fair quotation is as follows:

Youghiogheny Gas.....	\$5.35@5.85
Pittsburgh Steam.....	4.85@5.35
Bessemer.....	4.70@5.20
Ohio No. 8.....	4.65@5.15
Allegheny Valley.....	4.60@5.10
Cambria Co. Smithing.....	5.00@5.50
Pennsylvania Smokeless.....	4.90@5.40
All Slack.....	4.50@5.00
Cannel.....	5.60@6.10

All per net ton, f.o.b. Buffalo.

Anthracite—There is still much more demand than coal. It would seem that every consumer wanted it in April and now he must have it in May, though it is quite possible that the advance in price will hurt the trade, for the shipper is feeling rather easy over the situation, on the plea that the April orders are not usually cleaned up. The situation is really much more critical now, for there is much fear that the demand will not be satisfied before the fall trade sets in.

This may assure a better outlook for the winter, for there should be much more coal in the hands of consumers than there was last fall, in spite of the entire lack of it on the first of April this year. Many buyers are coming from Canada, with the idea that a personal demand will avail where letters or telephone messages would not. The city demand is quite as insistent as any, some of the trestles having next to no coal day after day and none of them running more than three days a week.

Still there is a fair amount of coal loading for the Lake trade, most of it by a single shipper, though coal is reported as running short, on account of slow mining and the Eastern demand. It will be a long time before the three branches of the anthracite trade, local, rail and Lake, will all be satisfied. The natural-gas producers are hard at work, sinking more wells, and it appears that the anthracite shippers are as anxious for them to succeed as anyone is, for they do not know where to turn.

Shipments for the week by Lake were 112,395 net tons, of which 54,700 tons cleared for Duluth and Superior, 23,800 tons for Chicago, 8,500 tons for Milwaukee, 5,000 tons for Green Bay, 7,395 tons for Fort William and 3,000 tons for Port Arthur.

TORONTO, CAN.

Trade active. Consumers laying in stocks ahead. Supplies on hand light and rail deliveries slow.

The coal trade has latterly been quite active both anthracite and bituminous moving freely, as many large consumers are stocking up in anticipation of a future shortage and increased prices. The supplies on hand at the yards are small and rail deliveries rather slow. Owing to the unsettled conditions the dealers are still refusing to make contracts or arrange for future deliveries. Pocahontas smokeless is much in demand, but very little is obtainable.

Quotations for best grades per short ton are as follows: Retail anthracite egg stove and nut, \$9; grate, \$9; pea, \$8; bituminous steam, \$8.70; slack, \$7.80; domestic lump, \$9; cannel, \$10; wholesale f.o.b. cars at destination three-quarter lump, \$6.74; slack, \$6.35; Pocahontas smokeless, \$7.75.

DETROIT

Heavy demand creates a tendency toward greater firmness in prices of steam coal. Movement in Lake trade is retarded by car shortage.

Bituminous—Railroad tracks in Detroit are practically clear of coal. Though there is little or no increase in demand, the limited supply creates a firm market with a tendency toward advancing prices. Some of the manufacturing plants which had accumulated moderate sized reserves during the period when belated shipments were arriving, have about exhausted their supplies and are again coming into the market. It is a matter of surprise to these consumers to learn that steam coal cannot be bought as cheaply now as two weeks ago, when considerable free coal was awaiting removal from railroad yards.

Jobbers are now quoting \$3.50 at the mine on steam lump, egg and slack and occasional sales are reported at even higher prices. Mine-run is offered at \$3.25 at the mines. While quotations are made on smokeless, they are regarded as merely nominal and jobbers are said to be un-

able to supply this grade. The prices are \$4.50 to \$5 on lump and egg and around \$3.50 on slack.

Temperatures unseasonably cold have continued during the week, creating a moderate demand for domestic sizes from family consumers. While a considerable proportion of the retail dealers are holding back on placing orders for renewed supplies, some business is being done.

Anthracite—Uncertainty of delivery is the dominant feature of the anthracite trade. Orders placed by some of the leading retail dealers have been filled only in part and in some cases not at all. Retailers are observing that householders are coming in larger number than usual to place orders for their winter fuel. The retailers' price in most instances is about \$9.25 on stove and egg sizes and for chestnut some of the dealers are said to be getting \$9.50.

Lake Trade—Deficient car supply is being blamed for the slow delivery of coal from the mines on loading docks for shipment in the Lake trade. Upbound steamers are now getting through the Straits of Mackinac to ports on Lake Michigan.

CLEVELAND

Car supply getting worse. Prices increasing very rapidly. \$10 coal predicted inside 90 days unless car supply is greatly improved.

The very poor car supply the past week has created an almost panicky spot market. Most of the Ohio mines have not averaged over 30 per cent. car supply, and as this percentage does not begin to give the mines enough cars to take care of contract obligations, the spot market has not been receiving its quota of shipments and prices have been jumping up at the rate of 25c. per day, and at this writing have reached \$5.50 per net ton, f.o.b. Cleveland, for slack, mine-run or three-quarter coal.

Notwithstanding the fact that Lake navigation has been held back on account of the ice in the upper Lakes, the demand for Lake coal has been getting stronger every day, and unless the car supply is greatly improved, there is no telling where the prices will go to. Many operators are of the opinion that we will see \$10 coal within ninety days unless the railroads get busy and increase the car supply at the mines.

The City of Cleveland advertised for bids on 12,000 tons mine-run to be furnished the garbage plant during the year beginning June 1, 1917. They received but one bid, which was from the Valley Camp Coal Co., and the price was \$7.25 per net ton, f.o.b. Cleveland. They have not as yet decided whether to accept same, but it is quite likely they will.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	\$5.50	\$5.50	\$5.50
Cambridge.....	5.50	5.50	5.50
Middle Dist.....	5.50	5.50	5.50
Hocking.....	5.50	5.50	5.50
Pocahontas.....	6.00	.....	.....

COLUMBUS

Higher prices and a stronger demand the chief features of the coal trade. Car supply bad and there is also considerable uncertainty in the future. Lake shipping under way.

The coal trade in Ohio has ruled firm in every particular during the past week. Demand for all grades is good and prices are ranging higher. The scarcity of cars is making shipping difficult and delays are frequent.

Steam business is now one of the strongest features of the market. All manufacturing lines are busy and fuel requisitions are large. Efforts of steam users to accumulate a surplus during the past few weeks have met with only partial success. But the situation as regards supplies is generally good and there is no marked shortage. One of the best features is the buying on the part of railroads. Inquiries have been placed with many producers and some few contracts have been closed at considerably higher than former figures. Considerable steam tonnage from West Virginia is now finding its way into the local market, although the car shortage is hampering that movement.

The domestic trade is also fairly active. Prices are higher and dealers are generally buying only what is needed for the immediate future. Considerable variation in prices is reported, premiums being freely paid where delivery can be assured. Retail stocks are rather small and there is no disposition to increase them at present. The stocking movement is expected to start somewhat earlier than usual.

Production in Ohio fields is not very large, although in some fields the car situation is improved. Considerable shortage of labor is reported especially in eastern Ohio. As a result the output is estimated at about 65 per cent. of normal in all fields. The Hocking Valley field had a better week than the previous week showed.

The Lake trade is now fairly well started, although considerable ice is still reported from the upper Lake regions. Loading of boats at Ohio ports is going on actively. Efforts to buy Lake tonnage by dockmen are not meeting with much success. The situation is very unsettled

and some Lake shippers believe that all-rail movement will be resorted to for a sufficient supply in the Northwest.

The board of purchase of Columbus has awarded the contract for Hocking nut, pea and slack for the month of May to the George M. Jones Coal Co., at \$4.60, delivered on track at the various city departments. The bid of \$5.75 for Hocking lump for other departments was refused and the board will buy in the open market. The above were the only two bids submitted upon the invitation of the board. The board of purchase has adopted the plan of buying for only one month, instead of six months at a time, as was the custom.

Prices on short tons, f.o.b. mines, are as follows:

	Hock-ing	Pom-eroey	Eastern Ohio
Rescreened lump.....	\$4.25	\$4.25	.....
Inch and a quarter.....	4.00	4.25	\$4.00
Three-quarter inch.....	4.00	4.00	4.00
Nut.....	4.00	4.00	4.00
Egg.....	4.00	4.00	.....
Mine run.....	4.00	4.00	4.00
Nut, pea and slack.....	3.75	3.75	3.75
Coarse slack.....	3.75	3.75	3.75

CINCINNATI

Continued car shortage and heavy demand in all departments have stiffened the market, and winter prices are in sight.

The tendency is distinctly toward greater strength and higher prices, owing to the uninterrupted continuance of the factors which have combined to hold up the market so far. The poor car supply, which at some mines has limited cars to one-third of requirements, now seems certain to continue indefinitely, and the demand for coal from large industrial consumers and from wholesalers and retailers of domestic grades is extremely heavy. The natural result is that prices are going still higher, and the top figures of the past remarkable winter season will be endangered soon. Domestic consumers have learned their lesson, and are already storing coal for next winter; retailers have usually had difficulty in getting orders for this purpose late in the summer. The market is wholly in the hands of the trade, with demand running far ahead of available supplies.

LOUISVILLE

Prices advance further on big demand and car and labor shortages. Wage advances also exert influence. Some relief hoped for from order to expedite coal traffic.

Further price advances are noted in this market on all coals, ascribed by operators to the big, general demand, shortage of coal cars and labor together with advance in wages. Car supplies ranging from 30 to 60 per cent. are reported and operators are of the opinion that coal equipment, which they expected to be plentiful by April, has been diverted for other uses. They are trusting that the Interstate Commerce Commission order to give coal and steel shipments preference will help things some.

A flat 20 per cent. advance in western Kentucky mines followed advances in the East. All grades of coal are in strong demand and operators speak of being able to sell unlimited quantities if they could get it out. Retailers are finding it impossible to stock at this time. One large buyer reported that out of fifteen letters to smokeless coal producers he got orders for five carloads accepted from two.

Eastern Kentucky quotes block around \$4.25, with nut and slack and mine-run around \$4, while western Kentucky quotes lump at \$2@2.50; mine-run and nut and slack at \$1.75@2.25; pea and slack, \$1.50@1.65, all prices f.o.b. the mines.

BIRMINGHAM

Demand holds up well. Prices inclined to stiffen. Production and movement suffer heavily from an increased shortage of equipment. Labor conditions unsatisfactory.

The demand for both steam and domestic coal continues good in the local market, and stocks are scarcer than a week ago. Prices failed to score any material increase, but the car situation has increased in gravity and the serious curtailment in production is expected to stiffen quotations very shortly.

Inquiries have been steady and of good volume, but buyers have been somewhat reticent about offering premiums over the schedules which have prevailed for several weeks. Contract business is being offered, but the spot demand is more than adequate to take care of all the available coal and the contract bookings are negligible. Spot prices per net ton, f.o.b. mines, are about as follows: Big Seam mine-run, \$2.75@3.00; Carbon Hill mine-run, \$3; Black Creek, Cahaba and Pratt, \$3.25@3.50.

Domestic coal schedules effective May 1 are as follows:

	Lump	Egg
Big Seam.....	\$2.40	\$2.40
Carbon Hill.....	2.65	2.65
Cahaba.....	3.40	3.40
Black Creek.....	3.40	3.40
Montevallo.....	3.65	3.65

It is understood that practically all the domestic mines have covered their output through to October, though many retail dealers have been unable to place orders for their full requirements. One of the larger domestic mines is adding facilities to increase its production several hundred tons per day, and many new operations are opening up, but will not be able to relieve the shortage materially unless a more liberal supply of cars is furnished the district, and relief from this source is very unlikely in the near future.

Coke

CONNELLSVILLE

Spot furnace coke off 50c. Production and shipments heavier. Wage advance averages 15 per cent.

The spot furnace coke market is off about 50c. in the week, on account of better car supplies putting the furnaces in moderately comfortable position. There is only a fair run of inquiry for spot furnace coke and the demand is supplied without much difficulty. The generally easier condition of the situation is shown by the fact that buyers are more particular as to brand. Several brands that were accepted as standard a few weeks ago are no longer taken as such, and bring \$7 when the market for standard brands is quotable at \$7.50, against \$8 a week ago. Spot foundry coke has scarcely softened perceptibly, remaining scarce.

The easier tone in the spot market has not affected operators' views as to contract prices and their ideas are still very high. Consumers are not inquiring to any extent.

The new wage scale, effective May 1, has been posted in the Connelville region, the advance growing out of the recent decision of the U. S. Steel Corporation to advance wages in all departments. Advances in the coke scale range from 10 to 20 per cent., according to the job, and average about 15 per cent. The advance may serve to check some men from leaving the region, but on the other hand there is a class of men who have not been working full time for months and these will probably work still less, as what they want is simply to make so much for each pay day.

The "Courier" reports production in the Connelville and lower Connelville region in the week ended Apr. 21 at 359,533 tons, a decrease of 13,681 tons, and shipments at 364,738 tons, a decrease of 7681 tons. The decreases were caused by the after effects of the Easter celebration and by scales at one important point being out of commission, whereby cars were diverted and will figure in the following week's returns. Production and shipments are now much heavier.

We quote: Spot furnace, \$7.50; contract, \$8.50; spot foundry, \$9.50@10.50; contract, \$8.50@9.25, per net ton at ovens.

Buffalo—The situation does not change materially. Shippers cannot get the cars that they need and men are as scarce as ever. This obliges consumers to pay the asking prices or go out of the business. As they find the demand for their products warrant paying the prices they try to make the best of the situation. Quotations, f.o.b. cars at Buffalo, are \$11@11.50 for 72-hour Connelville foundry, \$10 for 48-hour furnace and \$8.50 for low grades.

Chicago—Prices for byproduct domestic sizes are firm, and are about the same as announced earlier in the season. The disposition of producers seems to be to limit shipments to old customers on contracts. Few of the Chicago retailers are in position to furnish coke, owing to its scarcity. The Consumers company have quoted prices of \$9.25 for delivery in two-ton lots.

Birmingham—Coke prices continue stiff with no increase in the available supply. Spot foundry ranges from \$12.50 to \$15 per net ton, ovens, and furnace coke around \$7.50 to \$8. Free coke of either grade is very scarce. Representatives of smelting interests of Monterey, Mexico, were making inquiries in the local market during the past week for a considerable tonnage, but were unsuccessful in placing their order. The proposed deliveries covered an indefinite period.

Middle Western

GENERAL REVIEW

Car situation growing more serious. Shippers flooded with orders.

The car supply continues the leading topic of interest among the shippers due to the fact that it is rapidly becoming more acute, and a change for the better must soon occur or the situation will become serious. Until recently the mines in Illinois and Indiana were furnished with sufficient equipment to operate 60% to 75% capacity, but in the past two weeks this has shrunk to less than 50%. In addition to this labor troubles are causing reduced production. Orders are beyond all expectations, and most of the shippers are refusing to accept any business calling for immediate shipment, or making any promises as to date of deliveries.

Very little anthracite seems to be moving to the West; the supply at the head of the Lakes is exhausted, and jobbers and dealers in the Northwest are buying most any grade of bituminous obtainable to off-set this shortage. The anthracite shippers have so far failed to make a price for May shipment to the jobbers and dealers in the West, and this has caused more or less uneasiness especially among retailers who have named a price for delivery during the coming month. Quotations for May shipment will show a very noticeable increase due to the heavy increase in wages granted the miners. The question, however, among retail dealers is getting delivery.

The fact that the retailers are buying bituminous, of any quality available, in as large quantities as possible, and making an effort to stock up, gives some little encouragement to the operator. If the mines are kept steadily at work the coming summer with only a fair car supply, it is possible that by September most of the dealers will have a larger stock than at the beginning of the rush season last year, and the operator will then be in better shape to supply the demands.

CHICAGO

Market very strong. Anthracite and eastern bituminous scarce.

The market continues to show upward tendencies, and the prospects are there will be no abatement for some time to come. The demand for steam and railroad supply is unusually heavy, and the retail dealers are in the market as aggressively as during the winter months. None of the operating companies seem inclined to make contracts, especially since the open market will take every pound of coal that can be shipped at top notch prices.

In various parts of southern Illinois quite a lot of time has been lost due to strikes. The loss of tonnage from this cause is keenly felt at this time.

The Franklin County operators have advanced the price 25c. for May shipment, and some of the companies report sufficient orders now on hand to run them until after the middle of the month. Two of the largest operators in this county are booked up on the three major sizes for the month, and the total orders for the ensuing week are more than double the capacity of the mines. The railroads operating in the Northwest have placed additional orders for shipment during the next 90 days at prices almost double those of last year. Franklin County is taking care of some of this business, but most of it is going to Saline and Williamson Counties where the operators are not so heavily booked on domestic business.

Springfield district mines are booked up for the next few weeks. The mines in this field have quite a few contract obligations, especially with the railroads. Screenings and mine-run prices have advanced somewhat over last week, but the price on domestic lump and egg is the same as earlier in the month.

No change in price has been made in Fulton and Peoria Counties, but the May circular will in all probability show increases to cover the changes in the mining rate. Operators report plenty of business and very poor car supply.

In Bureau, La Salle and Grundy Counties the running time has been a little better than usual. The greater part of this coal is under contract, but what free coal is available has commanded good prices. The wage difficulty with the miners in this field is about settled, and with only a fair car supply, the movement will show quite an improvement.

Prices have been very strong in the Indiana field the past week, due to poor car supply and heavy demand by the steam and domestic trade of Indiana and Michigan. No changes in price have been reported but it is expected that next month's orders will be subject to an increase of 15 to 25c. over April.

Owing to the shortage of Pocahontas and other smokeless coals an increased demand is noted on Hocking, but little of this coal is moving to the West on account of demands closer home and for the Lake trade. Premium prices have been offered on all the Eastern coals, but to no avail.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump.....	\$2.50@2.75	\$2.50@2.75	\$2.75@3.00	\$2.75@3.00	\$3.00@3.25
Steam lump.....	2.00@2.50	2.25@2.75	2.25@2.75	2.25@2.75	2.75@3.00
Egg.....	2.50@2.75	2.50@2.75	2.75@3.00	2.75@3.00	3.00@3.25
Nut.....	2.50@2.75	2.50@2.75	2.75@3.00	2.75@3.00	3.00@3.25
Mine-run.....	1.75@2.50	2.25@2.75	2.25@2.75	2.25@2.75	2.25@2.75
Screenings.....	1.75@2.50	2.25@2.75	2.25@2.75	2.25@2.75	2.25@2.75
Lump.....	\$3.00@3.25	\$3.00@3.25	\$4.00@4.50	4.00@4.25	\$4.00@4.50
Egg.....	3.00@3.25	3.00@3.25	4.00@4.50	4.00@4.25	4.00@4.50
Nut.....	3.00@3.25	3.00@3.25	.....	.....	4.00@4.50
No. 1 nut.....	3.00@3.25	3.00@3.25	.....	.....	.....
No. 2 nut.....	3.00@3.25	3.00@3.25	.....	.....	.....
No. 3 nut.....	2.75@3.00	2.75@3.00	.....	.....	.....
No. 1 washed.....	3.00@3.25	.....	.....	.....	.....
No. 2 washed.....	3.00@3.25	.....	.....	.....	.....
Mine-run.....	2.50@2.75	2.25@2.75	4.00@4.25	3.25@4.00	3.75@4.00
Screenings.....	2.50@3.00	2.50@2.75	.....	.....	3.50@4.00

King Lump \$3.50@4.00. St. Louis Lump \$3.50@4.00.

Bureau, LaSalle & Grundy Counties:

Lump and Egg.....	\$2.75@3.00
No. 1 washed.....	3.00
No. 2 washed.....	3.00
Washed segs.....	2.75@3.00
Mine-run.....	2.25@2.50
Segs-raw.....	2.00@2.50

ST. LOUIS

Demand exceeding supply on everything in the local market. Unusually heavy calls for storage from the country and northern points, and local steam demand taking care of everything offered. Anthracite smokeless and Arkansas practically out of the market. Car supply two days a week.

One of the most unusual spring conditions that has ever existed in St. Louis prevails now. It is almost impossible to get prices on any grades of coal at times. This is occasioned by the fact that the mines are only getting about two days supply of cars per week for commercial loading, and mines that have railroad contracts manage to get two days work on that equipment. One of the principal causes for this is the fact that there is a motive power shortage on practically all roads.

In the Standard field 2-in. lump has advanced from \$1.65 and \$1.70 to \$2, with everything indicating that it is going higher. 6-in. lump is up as high as \$2.25, and a heavy tonnage of this is moving to Chicago and the Northwest.

The Mt. Olive mines are working perhaps more than any other in the district, as this tonnage is moving to Chicago and the cars come back promptly. There is a heavy tonnage of railroad coal contracted for in this field which gives two or three days a week car supply. The Mt. Olive coal for domestic purposes in St. Louis is \$2 to \$2.25 to the regular trade. New trade pays the circular price of \$2.50, which is the quotation that prevails outside of sales on a non-competitive market.

From the Williamson County field there is almost nothing offered. These mines have been sold up until well in the month of May. The cheapest coal on the market is \$3. The call is unusually good locally and from the country and the north for high-grade coal. There is practically no difference between any of the sizes in price, everything finding a ready market.

In a general way, it is impossible to get either steam or domestic contracts from any of the operators in any of the fields, extending beyond July. Where prices are sought the operators quote so far above a reasonable figure that the prices are always rejected.

The retail price on all coals advanced 25c. a ton on Apr. 23. On Apr. 28 the price of Williamson and Franklin County jumped from \$4.50 and \$4.67½ to \$5.37½, and further advances on other coal will be expected after the first.

The prevailing market per net ton, f.o.b. mines, is:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump.....	\$3.25	\$2.00@2.50	\$2.90@2.15
3x6-in. egg.....	3.25	2.00@2.50	2.00@2.15
2x3-in. nut.....	3.25	2.00@2.50	2.00@2.15
No. 2 nut.....	3.25	.....	.....
No. 3 nut.....	3.00	.....	.....
No. 4 nut.....	2.50	.....	.....
No. 5 nut.....	2.50	2.00@2.25	1.85@2.00
2-in. screenings.....	2.50	2.00@2.25	1.85@2.00
3-in. lump.....	.....	2.00@2.25	.....
Steam egg.....	3.00	2.00	1.85@2.00
Mine-run.....	2.75	2.00	1.85
Washed			
No. 1.....	3.50	2.75	.....
No. 2.....	3.25	2.75	.....
No. 3.....	3.25	.....	.....
No. 4.....	3.00	.....	.....
No. 5.....	2.50	.....	.....

Rate on Williamson and Franklin County is 72½c. Rate on other fields is 57½c.

Financial Department

Consolidation Coal Co.

This company reports for the year ended Dec. 31, 1916, as follows:

RESULTS FOR YEAR ENDING DEC. 31 (INCLUDING SUBSIDIARIES)

	1916	1915
Gross earnings, all sources.....	\$17,342,366	\$15,617,968
Oper. exp., taxes, etc.....	10,701,369	11,175,117
Depreciation.....	435,562	438,053
Net earnings.....	\$6,205,435	\$4,004,798
Fixed charges.....	1,799,000	1,208,020
Sk. fd. Cons. Coal bonds.....	330,879	261,097
Sk. fd. sub. cos. bonds.....		
Cash dividends (6%).....	1,500,781	1,500,000
Total deductions.....	\$3,630,661	\$2,969,117
Balance, surplus.....	2,674,774	1,035,681

COMBINED GENERAL BALANCE SHEET DECEMBER 31

Assets	1916	1915
Property account.....	\$54,511,023	\$53,315,601
Adv. payments on coal land purch.....	2,253,220	2,012,545
Due from fist and ref. mtge. trustee.....	b446,468	159,140
Stock reserved for conversion of bonds, etc.....	14,165,900	14,190,500
Stocks allied cos.....	4,640,084	3,906,888
Other investments.....	493,232	331,007
Sinking funds.....	936,578	899,855
Bonds in treasury.....	2,293,000	1,067,000
Coal and coke.....	1,208,027	1,253,531
Mat'ls, supp., etc.....	1,248,154	1,017,206
Bills receivable.....	155,034	127,482
Acc'ts receivable.....	6,799,424	6,086,520
Cash in banks, etc.....	2,673,479	4,224,186
Cash for bond int., and divs. due.....	70,688	70,201
Special deposits to cover royalties.....	11,554	11,094
Deferred items.....	173,183	
Total.....	\$92,079,048	\$88,672,756
Liabilities—	1916	1915
Capital stock.....	\$39,190,500	\$39,190,500
Outstanding, see foot note "c".....		
Bonded debt.....	24,072,000	23,224,000
7% conv. debts.....	6,997,000	7,000,000
Convertible 6s.....	6,477,500	6,500,000
Car trust bonds—assumed by C. & P. R.R.....	152,000	228,000
Purchase money obligations.....	2,615	6,215
Accounts payable.....	785,843	553,560
Pay-rolls.....	160,313	185,863
Royalties payable.....	11,554	12,114
Int. coup. & divs. not presented for payment.....	70,688	70,201
Bond int. accrued.....	387,854	392,036
Sink. fds. accrued.....	158,659	139,849
Taxes accrued.....	15,500	
Div. pay. Jan. 31.....	375,839	375,000
Individuals and cos.....	595,658	634,802
Profit and loss.....	12,625,525	10,160,617
Total.....	\$92,079,048	\$88,672,756

a Property account (\$54,511,023) includes: Coal lands and other real estate, \$32,283,834; mining plants and equipment, \$17,934,656; Cumberland & Penn. R.R., \$2,441,900; Cumberland & Penn. R.R. equipment, \$1,075,199; and floating equipment, \$765,433.

b For 75% of cost of improvements, extensions, etc., \$353,548, and for expenditures on Northern Coal lands, \$92,920.

c Includes \$6,169,300 stock reserved for conversion of 6% bonds and \$7,996,600 stock reserved for payment of principal and int. at maturity of the two-year 7% deb. bonds due Feb. 1, 1917, and for other corporate purposes.

The stock outstanding Dec. 31, 1916, amounted to \$25,024,600. On Feb. 2, this amount had been increased to \$35,107,380, as follows: (a) \$7,980,000 issued Feb. 1 in exchange for \$7,000,000 7% debentures, due that day and the two years' interest accrued thereon; (b) \$431,000 sold or otherwise disposed of, at par (making outstanding \$33,435,600); and (c) Stock dividend of 5% on the foregoing amount (valuing for \$1,671,780) paid Feb. 2, 1917.

d Stocks of other companies owned include 18,900 shares of com. stock and 5,400 shares Northwestern Fuel Co. pref. stock and 13,224 shares Metropolitan Coal Co. common stock. Of the above, 5,000 shares of M. C. Co. stock and 18,000 of the N. W. F. Co. common stock, together with \$6,500,000 1st & ref. M. bonds, are held by Equitable Trust Co. of New York, trustee, as collateral for convertible 6s.

e After deducting \$109,866 adjustments for previous years.

The aggregate outstanding bonded debt of the company is \$34,253,500, exclusive of \$2,293,000

COAL MINED BY THE COMPANY BY DIVISIONS (NET TONS)

	Maryland	W. Va.	Penn.	Mill. Cr.	Elkhorn	Total
1916.....	1,682,264	4,866,851	1,484,140	563,002	2,511,427	11,107,684
1915.....	2,263,341	5,206,079	1,923,487	602,025	1,727,451	11,722,383
1913.....	2,382,387	5,215,437	1,952,759	514,306	1,090,098	11,154,987
1912.....	2,422,556	5,125,662	1,957,862	385,648	255,372	10,347,100
1911.....	2,439,798	4,396,369	1,872,236	511,329		9,219,732
1910.....	2,605,456	5,967,877	1,921,777			10,495,110

The coal mined by lessees in 1916 aggregated 583,372 net tons, against 479,479 net tons in 1915. Coke manufactured by company, 112,018 net tons, against 89,197 net tons in 1915.

5% First and Refunding Mortgage bonds held in treasury, and \$1,000,000 of bonds of the Cumberland & Pennsylvania R.R., issued under its mortgage of April 1, 1891. The securities in the sinking fund of this mortgage, with the annual accretions, will provide ample funds for retirement of the bonds at their maturity. Included in the above outstanding bonded debt are \$6,477,500 of the \$6,500,000 ten-year 6 per cent. convertible secured gold bonds, \$22,500 of the said bonds having been converted prior to Dec. 31, 1916, and \$6,997,000 of the \$7,000,000 two-year 7% debenture bonds, \$3,000 of which were converted prior to Dec. 31, 1916.

In the Pennsylvania division the Western Maryland Ry. has completed its branch line and we have opened mines, built towns, and are shipping coal at the rate of over 1000 tons a day. In the West Virginia division, this railway's Helen's Run division has been completed. We have built towns, mining shafts have been sunk and are in operation, and we are shipping coal at the rate of 1200 tons a day. On the railway's Binghamon division in West Virginia, three mines have been opened, houses erected, and your company is ready to commence shipments of coal as soon as the railroad is completed. This railroad was started last spring and is expected to be completed by June 1, 1917.

Note—For previous annual report of this company, see Vol. 9, p. 782.

Nova Scotia Steel and Coal Co.

This company reports in part for the year ended Dec. 31, 1916, as follows:

The capital expenditure during the year has been necessarily high, mainly in connection with munition work. The sinking of the new Jubilee Shaft at Sydney Mines was resumed in April last. The shaft is now sunk to the depth of 740 ft. and by the use of a temporary hoisting plant this colliery is now producing about 550 tons of coal daily. Good progress was made in driving the new pair of slopes at Wabana; over 70% of this work had been completed and the remainder should be finished before Dec. 31, 1917.

On Dec. 31, 1916, the total assets of the company had grown to \$28,379,672 against \$15,841,880, as of Dec. 31, 1910, while the mining properties and appraised present value of real estate building, plant, machinery and equipment less depreciation written off had increased from \$13,490,553 in 1910, to \$20,036,596 in 1916. The inventories, not exceeding cost, now amount to \$4,022,667, against \$1,245,681 at the end of 1910, and the general reserve had increased to \$2,000,000 from \$750,000. Equally as striking is the phenomenal increase in the business handled during 1916, as compared with 1915, the first year in which Scotia made such a wonderful record in supplying shells and forgings, the directors reporting that the shipments of steel products, etc., for 1916, exceeded those of 1915, about 64%, while the output of forging shells during the year was 90% greater in number and 120% greater in weight than in the previous year.

The profit and loss surplus, Dec. 31, 1916, was \$3,535,086, against \$1,510,609, Dec. 31, 1910.

RESULTS FOR CALENDAR YEARS

	1916	1915
Profits for the year.....	\$2,731,787	\$2,094,170
Interest on bonds, etc.....	387,309	291,665
Int. on debenture stock.....	240,000	189,452
Div. on pref. stock (4%).....	80,000	(12) 123,600
Div. on common stock.....		
Impts. and betterments.....		36,310
Sinking fund and miscel.....		
Total.....	\$707,309	\$641,027
Balance, sur. or def. sur.....	\$2,024,478	\$1,453,143

* After deducting in 1916 \$1,490,586 depreciation, business profit tax for 1916 and 1915, patriotic contributions, etc.

United States Steel Corporation

The United States Steel Corporation mined 32,768,381 tons of coal in 1916, an increase of 6,139,899 tons over the previous year, of which 26,606,041 tons were used in making coke and the balance for steam, gas and other purposes. There was expended by all the coal and coke companies, \$2,354,901.12.

A partial list of the additions to the properties include 302 acres coking coal and 144 acres surface in the Connellsville district; 1650 acres coal and 59 acres surface in Franklin County, Illinois; additional houses and recreation buildings for employees at a cost of \$46,419.40 in the West Virginia, Pocahontas field, and a new coal mining plant near Benton, Ill.

A byproduct coke plant of 640 ovens is under construction at Clairton, Penn., to meet the coal requirements of which the Palmer and Crowthers mines are being opened and Gates and Edenhorn mines are being consolidated. The Ronco mine of the Sharon Coke Co. is being equipped to increase production and with facilities to load coal for river shipment, and at Sygan, Penn., a new shaft is being constructed at No. 1 mine.

There were 25,143 employees on the payrolls of the coal and coke companies during 1916, as compared with 19,485 in 1915.

The Northern coal and coke properties of the Corporation consist of 129,352 acres of coking coal; 97,551 acres of steam coal and 27,529 acres of surface. There are 71 coke plants with 22,100 bee-hive ovens and 1262 byproduct ovens, and 29 coal plants not connected with coke plants.

The Southern coal and coke property consists of 180,444 acres of mineral interests and surface; 136,594 acres of mineral interests only and 8824 acres of surface only. On the developed sections of this property there are 9 coal mining plants comprising 22 operating mines, 11 coal washing plants and 7 coking plants, the latter comprising, 2974 bee-hive coke ovens. At Fairfield, Ala., there is one byproduct coke plant, consisting of 280 ovens and a benzol recovery plant, operated in conjunction with the Ensley blast furnace.

The Trustees of the United States Steel and Carnegie Pension fund disbursed during the year in pensions to retired employees, \$711,130.33. Pensions were granted during the year to 275 retiring employees and at the close of the year there were 3013 names on the pension rolls. The average age at which pensions have been granted since the inauguration of the plan is 65.33 years, and the average term of service rendered by such pensioners was 29.93 years.

The total amount expended by the Corporation and the subsidiary companies during the year for safety work was \$848,080, in comparison with \$608,644 in the previous year. For sanitary work in and about the mines and mills \$1,402,798 was expended. For the protection of the water supply and drinking water systems for the use of the employees \$322,595 was spent.

There are maintained 17 clubs for employees with a membership of 5242; also 137 playgrounds; 125 athletic parks and 8 swimming pools.

POCAHONTAS CONSOLIDATED COLLIERIES

Earnings of this company for the past two years compare as follows:

Years	Gross Earnings	Net Earnings	Bond Interest, etc.
1916.....	\$2,489,153	\$2,091,857	\$915,884
1915.....	1,983,034	1,596,715	705,958
Years	Pf. Div. (6%)	Common Dividends	Balance Surplus
1916.....	\$156,595 (10)	\$452,000	\$567,378
1915.....	157,889 (6)	271,200	732,705